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ENERGY CONSERVATION PROVISIONS OF PRESIDENT CARTER'S ENERGY PROGRAM

(Parts A, B, C, and G of S. 1469)

DOCUMENTS

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HEARINGS

BEFORE THE

SUBCOMMITTEE ON ENERGY CONSERVATION AND REGULATION

OF THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

NINETY-FIFTH CONGRESS

FIRST SESSION

ON

THE NON-TAX PROVISIONS OF S. 1469—THE PRESIDENT'S ENERGY BILL

JUNE 21 AND 22, 1977

Publication No. 95-87

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ENERGY CONSERVATION PROVISIONS OF PRESIDENT CARTER'S ENERGY PROGRAM

(Parts A, B, C, and G of S. 1469)

TUESDAY, JUNE 21, 1977

U.S. SENATE,
SUBCOMMITTEE ON ENERGY CONSERVATION AND REGULATION,
OF THE COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, D.C.

The subcommittee met, pursuant to notice, at 7 a.m., in room 3110, Dirksen Office Building, Hon. Henry M. Jackson, chairman, presiding.

Present: Senators Jackson, Johnston, Metzenbaum, Hansen, Weicker, and Domenici.

Also present: Benjamin S. Cooper, professional staff member, and James T. Bruce, counsel.

OPENING STATEMENT OF HON. HENRY M. JACKSON, A U.S. SENATOR FROM THE STATE OF WASHINGTON

The CHAIRMAN. The subcommittee will come to order. We are a little late this morning. I notice it is 3 minutes after the hour.

This morning the Subcommittee on Energy Conservation and Regulation of the Committee on Energy and Natural Resources opens hearings on the energy conservation proposals contained in S. 1469, the nontax provisions of the President's energy bill. These proposals include:

A program requiring electric and natural gas utilities to provide information, financing, and contracting services to insulate the homes of their customers.

Amendments to existing housing statutes to make home improvement loans for energy conservation more attractive to both consumers and lending institutions.

Accelerated development of mandatory thermal efficiency standards for new buildings.

Establishment of mandatory efficiency standards for appliances.

A 3-year, $100 million program to demonstrate solar heating and cooling technology in Federal buildings.

These programs are consistent with the course the Congress has been taking since the embargo in attempting to stimulate investments by individuals in energy conservation improvements. The loan programs proposed recognize that the availability of capital to pay for insulation, et cetera, is a severe problem for many low- and middle-income families. Merely raising the price of the energy these families must

purchase certainly makes them wish they had bought insulation, but does little to help them afford it.

The mandatory standards proposed for consumer appliances will insure that appliance manufacturers, in fact, do achieve the savings which are known to be possible.

There is little controversy over the need to conserve. And I believe that the programs the administration has proposed are basically sound. If anything, this committee may want to go further in the direction of mandatory conservation than the administration has proposed.

We are scheduling hearings on the administration's proposals today and tomorrow to prepare for early consideration of this legislation in markup sessions after the Fourth of July recess. I expect that a strong omnibus energy conservation bill will be reported by the committee in July, and I hope we can pass legislation in the Senate prior to August.

At this point, I submit for the record committee print No. 1, the energy conservation language of S. 1469.

[The committee print referred to follows:]

[COMMITTEE PRINT NO. 1]

JUNE 6, 1977

95TH CONGRESS
1ST SESSION

S.

IN THE SENATE OF THE UNITED STATES

JUNE —, 1977

Mr. JACKSON introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

---

A BILL

To establish a comprehensive national energy conservation policy.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Energy Conservation Policy Act".

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PART A—ENERGY CONSERVATION PROGRAMS FOR EXISTING RESIDENTIAL BUILDINGS

Subpart 1—Utility Program

DEFINITIONS

SEC. 101. As used in this subpart:

(1) The term "Administrator" means the Administrator of the Federal Energy Administration.

(2) The term "Commission" means the Federal Power Commission.

(3) The term "natural gas" means natural gas as that term is defined in the Natural Gas Act.

(4) The term "nonregulated utility" means a public utility which is not a regulated utility.

(5) The term "public utility" means any person or State agency which is engaged in the business of selling natural gas or electric energy for purposes other than resale; except that such term shall be deemed not to include any such person or agency in any calendar year unless during the second preceding calendar year either (A) sales of natural gas by such person or agency exceeded ten billion cubic feet, or (B) sales of electric energy by such person or agency exceeded seven hundred and fifty million kilowatt-hours.

(6) The term "rate" means any price, rate, charge, or classification made, demanded, observed, or received with respect to sales of electric energy or natural gas, any rule, regulation, or practice respecting any such rate, charge, or classification, and any contract pertaining to the sale of electric energy or natural gas.

(7) The term "ratemaking authority" means authority to fix, modify, approve, or disapprove rates.

(8) The term "regulated utility" means a public utility with respect to whose rates a State regulatory authority exercises ratemaking authority.

(9) The term "residential building" means any building developed for residential occupancy, the construction of

which commenced prior to one year after the date of enactment of this subpart, which has a mechanical or electrical system for heating or cooling, or both, and which contains no more than two dwelling units.

(10) The term "residential customer" means any person to whom a public utility sells natural gas or electric energy for consumption in a residential building.

(11) The term "residential energy conservation measure" means—

(A) caulking and weatherstripping of all exterior doors and windows;

(B) furnace efficiency modifications limited to—

(i) replacement burners designed to reduce the firing rate or to achieve a reduction in the amount of fuel consumed as a result of increased combustion efficiency,

(ii) devices for modifying flue openings which will increase the efficiency of the heating system, and

(iii) electrical or mechanical furnace ignition systems which replace standing gas pilot lights;

(C) clock thermostats;

(D) ceiling, attic, wall, and floor insulation;

(E) hot water heater insulation; and

(F) storm windows.

(12) The term "residential energy conservation plan" means a plan approved by the Administrator pursuant to section 102(c) which is developed by a State regulatory authority or by a nonregulated utility.

(13) The term "State" means a State, the District of Columbia, Puerto Rico, and, at the discretion of the Administrator, any territory or possession of the United States.

(14) The term "State regulatory authority" means any State agency which has ratemaking authority with respect to the sale of electric energy or natural gas by any public utility (other than by such State agency).

(15) The term "suggested measures" means, with respect to a particular residential building, the residential energy conservation measures which the Administrator, in the rules prescribed pursuant to section 102(a), determines to be appropriate for the location and the category of residential buildings which includes such building.

(16) The term "utility program" means a program meeting the requirements of section 103 carried out by—

(A) a regulated utility pursuant to a residential energy conservation plan developed by a State regulatory authority;

(B) a nonregulated utility pursuant to a residential energy conservation plan developed by such utility; or

(C) a regulated or nonregulated utility pursuant to

an order of the Administrator issued pursuant to section 105.

RESIDENTIAL ENERGY CONSERVATION PLANS

SEC. 102. (a) The Administrator shall, not later than one hundred and twenty days after enactment of this subpart and after consultation with the Secretary of Housing and Urban Development and the heads of such other agencies as he deems appropriate, promulgate rules for the content and implementation of residential energy conservation plans.

(b) The rules prescribed pursuant to subsection (a)—

(1) shall identify the suggested measures for residential buildings, by climatic region and by categories determined by the Administrator on the basis of type of construction or any other factors which the Administrator may deem appropriate; and

(2) may include—

(A) standards for general safety and effectiveness of any suggested measure;

(B) standards for installation of any residential energy conservation measure; and

(C) such other requirements as the Administrator may determine to be necessary to carry out this subpart.

(c) Not later than one hundred and eighty days after promulgation of the rules described in subsection (a), each

State regulatory authority may submit, and each nonregulated utility shall submit a proposed residential energy conservation plan to the Administrator. The Administrator may, upon request of a State regulatory authority or nonregulated utility, extend the time period for submission of a plan by such authority or utility. Each such plan shall be reviewed and approved or disapproved by the Administrator not later than ninety days after submission. If the Administrator disapproves a plan, the State regulatory authority or nonregulated utility may submit a new or amended plan not later than sixty days after the date of such disapproval, or such longer period as the Administrator may, for good cause, allow. The Administrator shall review and approve or disapprove any such new or amended plan not later than ninety days after submission. After approval of a plan, a State regulatory authority or nonregulated utility may submit an amended plan with the consent of the Administrator.

(d) No residential energy conservation plan submitted by a State regulatory authority shall be approved by the Administrator unless such plan—

(1) requires each regulated utility over which such State regulatory authority exercises ratemaking authority to implement a utility program described in section 103;

(2) contains an adequate program for preventing

unfair, deceptive, or anticompetitive acts or practices affecting commerce which relate to the implementation of utility programs within such State;

(3) contains adequate procedures to assure that each regulated utility will carry out a utility program;

(4) contains adequate procedures to assure that each regulated utility will charge fair and reasonable prices and rates of interest to its residential customers in connection with the installation of residential energy conservation measures; and

(5) meets such other requirements as may be prescribed in the rules promulgated pursuant to subsection (a).

(d) No residential energy conservation plan proposed by a nonregulated utility shall be approved by the Administrator unless such plan—

(1) provides for the implementation by such utility of a utility program described in section 103;

(2) contains procedures pursuant to which such utility will submit a written report to the Administrator, not later than one year after approval of such plan and biennially thereafter, regarding the implementation of such utility program and containing such information as may be prescribed by the Administrator in the rules promulgated pursuant to subsection (a); and

(3) meets such other requirements as may be prescribed in the rules promulgated pursuant to subsection (a).

UTILITY PROGRAMS

SEC. 103. (a) Except as provided in subsections (b) and (c), each utility program shall include—

(1) procedures designed to inform, no later than January 1, 1980, each of its residential customers who owns or occupies a residential building in which the suggested measures have not been installed, of—

(A) the suggested measures for the category of buildings which includes such residential building;

(B) the savings in costs of home heating and cooling that are likely to result from installation of the suggested measures in typical residential buildings in such category; and

(C) the availability of the arrangements described in paragraph (2) of this subsection;

(2) procedures whereby the public utility, no later than January 1, 1980, will offer each such residential customer the opportunity to enter into arrangements with the public utility under which the public utility, directly or through one or more contractors will—

(A) inspect the residential building to deter-

mine and apprise the residential customer of the estimated cost of purchasing and installing each suggested measure;

(B) offer to have the suggested measures installed;

(C) make, or arrange for another lender to make, a loan to such residential customer to finance the purchase and installation costs of suggested measures purchased from and installed by any of the following persons:

(i) the public utility, or

(ii) the public utility and one or more contractors, or

(iii) one or more contractors,

subject to such reasonable requirements as to creditworthiness as may be permitted by the applicable residential energy conservation plan and to the right of the public utility to inspect the residential building to confirm the installation of suggested measures;

(D) permit the residential customer to repay the principal of and interest on any loan made pursuant to subparagraph (C), over a period of not less than three years, as a part of his periodic bill except that a lump-sum payment of outstanding

principal and interest may be required upon default in payment by the residential customer;

(3) procedures whereby the public utility prepares and sends to each of its residential customers a list of suppliers and contractors in its service area who sell and install residential energy conservation measures which list is designed to encourage participation by such contractors and suppliers in a nondiscriminatory manner; and

(4) procedures whereby the public utility prepares and sends to each of its residential customers a list of banks, savings and loan associations, credit unions, and other public and private lending institutions in its service area which offer loans for the purchase and installation of residential energy conservation measures.

(b) The Administrator may, upon petition of a public utility, supported in the case of a regulated utility by the appropriate State regulatory authority, waive in whole or in part the requirements of paragraphs (1) (c) and (2) of subsection (a) with respect to the utility program of such utility if such utility demonstrates to the satisfaction of the Administrator that, despite good faith efforts on its part, it is unable to meet the requirements of paragraph (2) of subsection (a) because it both lacks the financial capability to extend loans in accordance with such paragraph

and is unable to arrange with any other suitable financial institution for the making of such loans, except that no public utility may be granted a waiver under this section unless such utility demonstrates to the satisfaction of the Administrator that it has dedicated all capital reasonably available to it toward meeting the requirements of paragraph 2 of subsection (a).

ALTERNATIVE PROGRAMS

SEC. 104. (a) A State regulatory authority or a public utility (supported in the case of a regulated utility by the appropriate State regulatory authority) may apply for an exemption from the requirements of section 103 at any time prior to one year after enactment of this Act. The Administrator shall grant such an exemption if such authority or utility demonstrates to the satisfaction of the Administrator that it has implemented or will implement an alternative program providing for the installation of residential conservation measures in the homes of its residential customers which program meets the requirements of this subsection. No exemption shall be granted by the Administrator unless the alternative program of such authority or utility includes the following:

(1) procedures whereby the utility informs each of its residential customers who owns or occupies a residen-

tial building in which the suggested measures have not been installed, of—

(A) the suggested measures for the category of residential buildings which includes such building;

(B) the savings in costs of home heating and cooling that are likely to result from installation of the suggested measures in typical residential buildings in such category; and

(C) the availability of arrangements for purchase and installation of such measures;

(2) procedures whereby arrangements are offered for the installation of the suggested measures to such residential customers; and

(3) such other requirements as the Administrator determines.

(b) Any application for exemption pursuant to subsection (A) shall contain such information as the Administrator may by rule require.

(c) No application pursuant to subsection (a) shall be approved by the Administrator unless he determines that the alternative program is likely to result in the installation of suggested measures in as large a number of residential buildings as would have been installed had such utility submitted a program which meets the requirements of section 103.

(d) Any State regulatory authority or public utility may apply for a temporary exemption prior to the promulgation of guidelines pursuant to section 102. A temporary exemption may be granted from the requirements of section 103 for a period not to exceed two years after the date of enactment of this Act, if such authority or utility demonstrates to the satisfaction of the Administrator that it has implemented or proposes to implement an energy conservation program for residential customers which is likely to result in the installation of suggested measures in a substantial proportion of residential buildings.

FEDERAL STANDBY AUTHORITY

SEC. 105. (a) If a State regulatory authority has not had a plan approved under section 102 (c) within two hundred and seventy days after promulgation of rules under section 102 (a), or within such additional period as the Administrator may allow pursuant to section 102 (c) (1), or if the Administrator determines that such State regulatory authority has not adequately implemented an approved plan, the Administrator shall, by order, require each public utility in the State to offer to its residential customers a utility program prescribed in such order which meets the requirements specified in subsection (a) of section 103.

(b) If a nonregulated utility has not had a plan approved under section 102 (c) within two hundred and sev-

enty days after promulgation of rules under section 102 (a) or within such additional period as the Administrator may allow pursuant to section 102 (c), or if the Administrator determines that such nonregulated utility has not adequately implemented an approved plan, the Administrator shall, by order, require such nonregulated utility to offer its customers a utility program prescribed in such order which meets the requirements specified in subsection (a) of section 103.

(c) If the Administrator determines that any public utility to which an order has been issued pursuant to subsection (a) or (b) has failed to comply with such order, he may either order that such public utility may not increase any at which it sells natural gas or electric energy until such time as he determines that such utility has implemented a utility program meeting the requirements of the order issued pursuant to subsection (a) or (b), or petition the district courts of the United States to enjoin such utility from violating an order issued pursuant to this subsection.

(d) Any public utility which violates an order under subsection (b) shall be subject to a civil penalty of not more than $25,000 for each violation. Each day that such violation continues shall be considered a separate violation.

RELATIONSHIP TO OTHER LAWS

SEC. 106. The Administrator may by order upon petition by a public utility and for good cause, supersede any

law or regulation of any State or political subdivision thereof, to the extent that such law or regulation prohibits a public utility from taking any action required to be taken under section 103 of this Act.

CONTRACT PROVISIONS

SEC. 107. No public utility shall be subject to any liability under any provision in any contract which restricts any public utility from lending, borrowing, or entering a new line of business, if such lending, borrowing, or entering a new line of business is required under section 103 of this Act.

RULES

SEC. 108. The Administrator is authorized to promulgate such rules as may be necessary to carry out this subpart.

AUTHORIZATION OF APPROPRIATIONS

SEC. 109. There are hereby authorized to be appropriated to the Administrator such sums as may be necessary to carry out his responsibilities under this subpart.

Subpart 2—Financing Program

AMENDMENTS TO NATIONAL HOUSING ACT

SEC. 110. Section 2 (a) of the National Housing Act is amended by adding at the end of the first paragraph thereof the following sentence: "For the purpose of this section, the terms 'financial institution' and 'lending institution' shall be deemed to include any public utility which is engaged in making loans or advancing credit for energy conserving

improvements as defined in subparagraph (2) of the fourth paragraph of this section only for the purposes of such loans or advances of credit. The term 'public utility' means any person or State agency which is engaged in the business of selling natural gas or electric energy for purposes other than resale.".

SEC. 111. Subparagraphs (2) and (3) of the fourth paragraph of section 2(a) of the National Housing Act are amended to read as follows:

"(2) The term 'energy conserving improvements' means (i) energy conservation measures as defined in section 101 of the National Energy Act, or (ii) any addition, alteration, or improvement to an existing or new structure which is designed to reduce the total energy requirements of that structure, and which is in conformity with such criteria and standards as shall be prescribed by the Secretary in consultation with the Administrator of the Federal Energy Administration; and

"(3) the term 'solar energy system' means any addition, alteration, or improvement to an existing or new structure which is designed to utilize solar energy to reduce the energy requirements of that structure from other energy sources, and which is in conformity with such criteria and standards as shall be prescribed by the

Secretary in consultation with the Administrator of the Federal Energy Administration.".

SEC. 112. Section 2 (f) of the National Housing Act is amended by adding the following at the end thereof: "The Secretary shall conduct a study within two years after the enactment of the National Energy Act in order to determine an actuarially sound premium rate for loans for energy conserving improvements authorized under section 2 (a) of this subchapter, and shall, based on this study, no earlier than two years after date of enactment of the National Energy Act, set an actuarially sound premium rate for such loans, which rate may exceed the otherwise applicable 1 per centum limitation of this subsection.".

SEC. 113. Section 302 (h) of the Federal Home Loan Mortgage Corporation Act (12 U.S.C. 1451 (h)) is amended by adding at the end thereof a new sentence, to read as follows: "The term 'residential mortgage' is deemed to include a loan or advance of credit insured under title I of the National Housing Act whose original proceeds are applied for in order to finance energy conserving improvements to residential real estate. The term 'residential mortgage' is also deemed to include a loan or advance of credit for such purposes not having the benefit of such insurance and to include loans made where the lender relies for pur-

poses of repayment primarily on the borrower's general credit standing and forecast of income, with or without other security.".

AMENDMENT TO FEDERAL NATIONAL MORTGAGE ASSOCIATION CHARTER ACT

SEC. 114. Section 302 (b) of the Federal National Mortgage Association Charter Act is amended by adding at the end thereof the following new paragraph:

"(3) The corporation is authorized to purchase, service, sell, lend on the security of, and otherwise deal in loans made for the energy conservation purposes described in section 2 (a) of the National Housing Act, whether or not insured under such section. To be eligible for purchase, any such loan not so insured may be secured as required by the corporation.".

AMENDMENT TO ENERGY CONSERVATION AND PRODUCTION ACT

SEC. 115. Section 422 of the Energy Conservation and Production Act is amended to read as follows:

"AUTHORIZATION OF APPROPRIATIONS

"SEC. 422. There are authorized to be appropriated for purposes of carrying out the weatherization program under this part, not to exceed $55,000,000 for the fiscal year ending September 30, 1977, not to exceed $130,000,000 for the fiscal year ending September 30, 1978, not to exceed

$200,000,000 for the fiscal year ending September 30, 1979, and not to exceed $200,000,000 for the fiscal year ending September 30, 1980, such sums to remain available until expended.".

Subpart 3—New Building Performance Standards Grants

AUTHORIZATION FOR SECTION 307(b) OF ENERGY CONSERVATION AND PRODUCTION ACT

SEC. 131. Section 307(b) of the Energy Conservation and Production Act is amended to read as follows:

"(b) There is authorized to be appropriated for the purpose of carrying out this section, the following amounts—

"(1) for the fiscal year ending September 30, 1977, not to exceed $5,000,000;

"(2) in the fiscal year ending September 30, 1978, not to exceed $10,000,000; and

"(3) in the fiscal year ending September 30, 1979, not to exceed $10,000,000.

Any amount appropriated pursuant to this subsection shall remain available until expended.".

PART B—ENERGY EFFICIENCY STANDARDS FOR CONSUMER PRODUCTS

Subpart 1—Consumer Products Other Than Automobiles

AMENDMENT TO ENERGY POLICY AND CONSERVATION ACT

SEC. 201. (a) Section 325(a) of the Energy Policy and Conservation Act is amended to read as follows:

"(a) (1) (A) Except as otherwise provided in paragraph (3), the Administrator shall, by rule, prescribe an energy efficiency standard for each type or class of covered product specified in paragraphs (1), (2), (5), (6), (9), (12), and (13) of section 322 (a).

"(B) The Administrator may, by rule, prescribe an energy efficiency standard for any type or class of covered products of each of the types specified in paragraphs (3), (4), (7), (8), (10), (11), and (14) of section 322 (a), except that the Administrator may not prescribe an energy efficiency standard for a type or class of covered product described in paragraph (14) of section 322 (a) unless he determines that—

"(i) average per household energy use by products of such type exceeds 150 kilowatt-hours (or its Btu equivalent) per year;

"(ii) aggregate household energy use by products of such type exceeds 4,200,000,000 kilowatt-hours per year; and

"(iii) substantial improvement in the energy efficiency of products of such type is possible.

"(2) No standard for a type (or class) of covered product shall be prescribed pursuant to paragraph (1) unless a test procedure has been prescribed pursuant to section 323 with respect to that type (or class) of product.

"(3) The Administrator shall not prescribe an energy

efficiency standard for a type or class of covered product if he determines that the establishment of such standard is not technologically feasible or not economically justified.

"(4) Energy efficiency standards established pursuant to this section shall be designed to achieve the maximum improvement in energy efficiency which the Administrator determines is technologically feasible and economically justified, and may be phased in over a period of years through the establishment of intermediate standards.

"(5) In determining whether a standard is economically justified pursuant to paragraph (3) or (4), the Administrator shall consider—

"(A) the economic impact of the standard,

"(B) the total projected amount of energy savings likely to result from the imposition of the standard,

"(C) the savings in operating costs throughout the estimated average life of covered products in the type or class, compared to any increase in the price of or in initial charges for, or maintenance expenses of, the covered product which is likely to result from the imposition of the standard,

"(D) any lessening of the utility or the performance of the covered product likely to result from the imposition of the standard,

"(E) any negative effects on competition likely to result from the imposition of the standard,

"(F) the need of the Nation to conserve energy, and

"(G) any other factors he considers relevant.

"(6) A rule prescribing an energy efficiency standard for a type or class of covered product may, for not more than two years, exempt, in whole or in part, from its requirements manufacturers of covered products whose gross revenues from all operations (including but not limited to the manufacture and sale of covered products) do not exceed $8,000,000 per annum, as determined by the Administrator, and with respect to whom the Administrator determines imposition of the standard may result in a substantial lessening of competition.

"(7) A rule prescribing an energy efficiency standard for a type or class of covered product may specify different minimum levels of energy efficiency for covered products within such type or class based upon the kind of energy consumed by such covered products.

"(8) The Administrator shall, not later than five years after promulgation of an energy efficiency standard, conduct a reevaluation in order to determine whether such standard should be modified. In conducting such reevaluation the Administrator shall take into account such information as he deems relevant, including technological developments with respect to the manufacture of the type or class of covered product involved and the economic impact of the standard.".

(b) Section 325(b) of the Energy Policy and Conservation Act is amended by redesignating paragraphs (2) and (3) as paragraphs (3) and (4) respectively, and inserting a new paragraph (2) to read as follows:

"(2) With respect to covered products of each of the types specified in section 325(a)(1)(A), an advance notice of proposed rulemaking with respect to such type or class of covered product shall be promulgated by the Administrator not later than thirty days after a test procedure with respect to that type or class of covered product has been prescribed, or thirty days after enactment of the National Energy Act, whichever is later.".

(c) Part B of title III of the Energy Policy and Conservation Act is further amended as follows:

(1) Section 324(c)(5) is amended by inserting ", including instructions for the maintenance, use, or repair of the covered product," after "energy consumption" in the matter following subparagraph (C).

(2) Section 325(d) is deleted.

(3) Section 326 is amended by adding a new subsection (d), to read as follows:

"(d) The Administrator may require each manufacturer of covered products to submit such information or reports with respect to energy efficiency of such covered products as the Administrator determines may be necessary to establish standards under section 325.".

(4) Section 336(a)(1) is amended by (A) striking out "(1)" and (B) by striking out "325(a)(1), (2), or (3)" in the first sentence thereof and inserting in lieu thereof the following: "325(a)".

(5) Section 336(a)(1)(B) is amended by striking out "paragraph (1), (2), or (3) of" in the first sentence thereof.

(6) Section 336(a)(2) is deleted.

(7) Sections 336(b)(1) and (2) are amended by striking out "section 323 or 324" and inserting in lieu thereof "section 323, 324, or 325".

(8) Section 336(b)(5) is deleted.

(9) Section 339(a) is amended to read as follows:

"(a) There are authorized to be appropriated to the Administrator to carry out his responsibilities under this part not to exceed $1,700,000 for fiscal year 1976, not to exceed $3,056,000 for fiscal year 1977, and for each fiscal year thereafter such sums as may be necessary.".

Subpart 2—Disclosure of Automobile Fuel Inefficiency Tax and Disclosure of Automobile Fuel Efficiency Rebate

DISCLOSURE IN LABELING

SEC. 221. Section 506(a)(1) of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 1901 et seq.) is amended by redesignating subparagraph (C) as subparagraph (E) and by adding new subparagraphs (C) and (D) to read as follows:

"(C) containing, in the case of any automobile the sale of which is subject to the fuel inefficiency tax imposed pursuant to section 4064 of the Internal Revenue Code of 1954, a statement indicating that a tax was paid with respect to such sale and indicating the amount of such tax, and

"(D) containing, in the case of any automobile with respect to the sale of which an amount is paid or credited pursuant to section 6429 of the Internal Revenue Code of 1954, a statement indicating that a payment or credit was made with respect to such sale and the amount of such payment or credit.".

DISCLOSURE IN ADVERTISING

SEC. 222. (a) The Federal Trade Commission is authorized to prescribe rules requiring disclosure of any tax imposed under section 4064 of the Internal Revenue Code of 1954 or rebate payable under section 6429 of such Code with respect to any automobile advertised in any television broadcast or advertisement in writing which states the price or fuel economy of an automobile or which advertises an identifiable model type of automobile.

(b) A violation of a rule under subsection (a) shall be deemed an unfair or deceptive act or practice affecting commerce, for purposes of the Federal Trade Commission Act.

(c) Nothing in this section shall be construed as restricting any authority of the Commission under any other law.

PART C—ENERGY CONSERVATION PROGRAM FOR SCHOOLS AND HOSPITALS

AMENDMENT TO ENERGY POLICY AND CONSERVATION ACT

SEC. 301. Title III of the Energy Policy and Conservation Act is amended by adding at the end thereof the following new part:

"PART F—ENERGY CONSERVATION PROGRAM FOR SCHOOLS AND HOSPITALS

"DEFINITIONS

"SEC. 391. For purposes of this part:

"(1) The term 'building' means any structure that includes a heating or cooling system, or both, the construction of which structure was completed on or before April 20, 1977.

"(2) The term 'energy conservation measure' means—

"(A) insulation of walls, ceilings, attics, floors, ducts, and pipes;

"(B) double glazing energy control systems;

"(C) automatic energy control systems;

"(D) solar heating and/or cooling systems;

"(E) solar water heating systems;

"(F) furnace modifications limited to (i) replacement burners designed to reduce the firing rate or to achieve a reduction in the amount of fuel consumed as a result of increased combustion efficiency, and (ii) devices for modifying flue openings which will increase the efficiency of the heating system;

"(G) caulking and weatherstripping of exterior doors and windows;

"(H) reflective glass coatings;

"(I) lighting fixture retrofit, to the extent that such retrofit does not result in any foot candle per square foot increase in the general illumination level of the facility and conserves energy; and

"(J) electrical or mechanical furnace ignition systems which replace standing gas pilot lights, but only as part of a project which includes one or more of the energy conservation measures specified in paragraphs (A) through (I).

"(3) The term 'Governor' means the chief executive officer of a State.

"(4) The term 'hospital' means a public or nonprofit institution which is—

"(A) a general hospital, tuberculosis hospital, or any other type of hospital, other than a hospital furnishing primarily domiciliary care; and

"(B) duly authorized to provide hospital services under the laws of the State in which it is situated.

"(5) The term 'hospital facilities' means buildings housing a hospital and related facilities, including laboratories, outpatient departments, nurses' home and training facilities and central service facilities operated in connection with a hospital, and also includes buildings housing education or training facilities for health professions personnel operated as an integral part of a hospital.

"(6) The term 'public or nonprofit institution' means an institution owned and operated by—

"(A) a State, a political subdivision of a State or an agency or instrumentality of either; or

"(B) an organization exempt from income tax under section 501 (c) (3) of the Internal Revenue Code of 1954.

"(7) The term 'project' means an undertaking to acquire and/or install one or more energy conservation measures in school facilities or in hospital facilities.

"(8) The term 'project costs' shall be limited to costs incurred in the design, acquisition, construction, and installation of energy conservation measures.

"(9) The term 'school' means a public or non-profit institution which—

"(A) provides, and is legally authorized to provide, elementary education or secondary education, or both, on a day or residential basis; or

"(B) (i) provides, and is legally authorized to provide, a program of education beyond secondary education, on a day or residential basis;

"(ii) admits as students only persons having a certificate of graduation from a school providing secondary education, or the recognized equivalent of such certificate;

"(iii) is accredited by a nationally recognized accrediting agency or association; and

"(iv) provides an educational program for which it awards a bachelor's degree or provides not less than a two-year program which is acceptable for full credit toward such a degree at any institution which meets the requirements of subparagraph

(i), (ii), and (iii) and which provides such a program.

Such term also includes any public or nonprofit institution which provides not less than a one-year program of training to prepare students for gainful employment in a recognized occupation and which meets the provisions of subparagraphs (i), (ii), and (iii) of paragraph (B).

"(10) The term 'school facilities' means buildings, housing classrooms, laboratories, dormitories, athletic facilities, or related facilities operated in connection with a school, but does not include any facility used or to be used for sectarian instruction or as a place for religious worship, or any athletic facility used primarily for athletic exhibitions, contests, games, or other events for which admission is charged to the general public.

"(11) The term 'State' means a State, the District of Columbia, and at the discretion of the Administrator, Puerto Rico, or any territory or possession of the United States.

"GRANT AUTHORIZATION

"SEC. 303. (a) The Administrator is authorized to make grants to the States to assist schools and hospitals in the payment of project costs incurred in connection with projects undertaken pursuant to this part.

"(b) The Federal share of the project costs incurred

in connection with any project shall not exceed 40 per centum thereof. The remainder of the project costs shall be provided from sources other than Federal funds.

"STATE PLANS

"SEC. 304. (a) The Administrator shall, by rule, not later than one hundred and twenty days after the date of enactment of this part, prescribe guidelines for the development of State plans for installation of energy conservation measures in school facilities and hospital facilities, including guidelines indicating the types of measures appropriate for each region of the Nation. The Administrator shall invite the Governor of each State to submit, within ninety days after the effective date of such guidelines, or such longer period as the Administrator may, for a good cause, allow, a proposed State plan for such State. Such plan shall include:

"(1) A general description of the State's proposed program for installation of energy conservation measures in school and hospital facilities in such State over the period for which funds are authorized to be appropriated pursuant to section 308, including—

"(A) the types of energy conservation measures considered for installation in school and hospital facilities under projects undertaken pursuant to this part;

"(B) categories of school and hospital facilities for which installation of energy conservation measures are proposed (as may be required by the guidelines); and

"(C) an estimate of the energy savings anticipated for each type of proposed project.

"(2) The policies and procedures by which the State proposes to allocate funds among eligible projects within the State, including a description of how priorities will be established among competing proposals, based on relative financial needs and capabilities.

"(b) Each State plan shall be reviewed and approved or disapproved by the Administrator not later than ninety days after submission. A Governor may submit a new or amended plan at any time after submission of the original plan if the State obtains the consent of the Administrator.

"(c) Governors submitting plans pursuant to this section shall take reasonable steps to assure that such plans are appropriately coordinated with State health plans required pursuant to section 1523 of the Public Health Service Act.

"FINANCIAL ASSISTANCE

"SEC. 305. (a) The Administrator shall provide financial assistance from sums appropriated for any fiscal year under this part only upon annual application. The Admin-

istrator shall allocate the sums appropriated for that fiscal year among the several States in the following manner:

"(1) Ninety per centum among all States in accordance with a formula to be determined by the Administrator, by rule, taking into account population, climate, and such other factors as the Administrator may deem appropriate.

"(2) Ten per centum among all States as the Administrator shall determine, after taking into account the availability and cost of fuel or any other energy used in schools and hospitals in the several States and such other factors as he deems relevant.

"(b) Any amount allocated to a State for a fiscal year under subsection (a) but not requested by a State or not disbursed pursuant to an approved State plan shall be available for reallocation to the States as the Administrator shall determine in accordance with subsection (a) (2).

"(c) The Administrator shall prescribe rules limiting the amount of funds allocated to a State which may be expended for administrative expenses by such State.

"APPLICATIONS

"SEC. 306. (a) Applications of States for financial assistance under this part shall be made annually to the Administrator, shall be consistent with State plans approved pursuant to section 304, and shall contain or be accompanied

by such information as the Administrator may reasonably require. Such information shall include the number of projects and categories of facilities proposed to be funded within such State, and such information concerning expected expenditures as may be required by rule.

"(b) The Administrator shall not provide financial assistance under this part unless the applicant has provided reasonable assurances that it has—

"(1) established procedures to assure that funds made available under this part will be expended for project costs in compliance with the requirements of this part and rules promulgated under this part;

"(2) established procedures for allocating funds among eligible projects on the basis of relative need, taking into account appropriate financial, climatic, and energy conservation factors;

"(3) established procedures for implementation of energy conserving operational and maintenance procedures in those facilities for which projects are proposed;

"(4) established policies and procedures designed to assure that financial assistance provided under this part will be used to supplement, and not to supplant, State, local or other funds, and, to the extent practicable,

to increase the amounts of such funds that would be made available in the absence of Federal funds for carrying out this part;

"(5) established procedures to provide reports to the Administrator in such form and containing such information (including information for evaluation purposes) as the Administrator may reasonably require and to keep such records and furnish access thereto as the Administrator may find necessary to assure the correctness and verification of such reports; and

"(6) established procedures to insure that equitable consideration is given to all eligible public or nonprofit institutions regardless of type of ownership.

"ADMINISTRATION

"SEC. 307. The Administrator is authorized to prescribe such rules as may be necessary in order to carry out the provisions of this part.

"AUTHORIZATION OF APPROPRIATIONS

"SEC. 308. (a) For purposes of making grants pursuant to this part, there is authorized to be appropriated not to exceed $300,000,000 for each fiscal year in the three consecutive fiscal year period ending September 30, 1980.

"(b) For expenses of the Administrator in administering the provisions of this part, there are authorized to be

appropriated such sums as may be necessary to carry out the provisions of this part for each fiscal year in the three consecutive fiscal year period ending September 30, 1980.

"NONDISCRIMINATION

"SEC. 309. No person in the United States shall on the grounds of race, color, religion, national origin, or sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity funded in whole or in part with funds made available under this part.".

PART G—FEDERAL ENERGY INITIATIVES

Subpart 1—Federal Van Pooling Program

SEC. 701. Section 381 of the Energy Policy and Conservation Act is hereby amended by—

(1) inserting "and subsection (c)" before the colon in subsection (b) (2);

(2) redesignating subsection (c) as subsection (d); and

(3) inserting after subsection (b) the following new subsection:

"(c) (1) The Administrator may, by rule, after consultation with the Administrator of the General Services Administration, provide for the establishment of a program or programs pursuant to which van pooling arrangements are offered and provided to officers and employees of the Federal Government. Any such program may be phased over a pe-

riod of years, and may be limited by the Administrator to one or more reasonable categories of officers and employees determined by the Administrator, including, without limitation, categories determined by such factors as location of residence, location of place of business or regular hours of work. The number or vans in use in van pooling arrangements authorized under this subsection shall at no time exceed six thousand.

"(2) In order to establish, maintain, and operate any program authorized to be established by the Administrator under paragraph (1) of this subsection, the Administrator of the General Services Administration, in consultation with the Administrator, shall be authorized to—

"(A) acquire vans by purchase, lease, or other arrangement;

"(B) establish and operate training programs for operators of vans;

"(C) establish and maintain, or require departments and agencies to establish and maintain, lists of officers and employees participating, or desiring to participate, in van pooling arrangements;

"(D) permit any person authorized to operate a van pursuant to a van pooling arrangement to—

"(i) operate the van for personal use (other than for use on vacation trips and trips over extended distance, as defined by the Administrator of

the General Services Administration), with or without a charge for such personal use as determined by the Administrator of the General Services Administration, and subject to the provisions of paragraph (3) (C) (iv) of this subsection; and

"(ii) retain a portion of the rider charges paid by officers and employees participating in such van pooling arrangements if the Administrator of the General Services Administration determines that such retention will promote full use of van capacity; and

"(E) exercise such other powers now or hereafter vested in him as he determines to be necessary or appropriate.

"(3) Any program established pursuant to paragraph (1) of this subsection shall include—

"(A) a requirement that officers and employees participating in van pooling arrangements authorized under such program pay a rider charge, including an actuarially determined sum for Government self-insurance against liability which may be imposed on the Federal Government due to van pooling use, in such amount and at such intervals as the Administrator of the General Services Administration may determine, except that the Administrator of the General Services Administration may provide that a person authorized to operate

a van pursuant to a van pooling arrangement may not be required to pay a rider charge;

"(B) a requirement designed to assure that van pooling arrangements authorized under such program will insure that, not later than eight years from commencement of the program, all costs and expenses, including estimated administrative expenses, incurred by the Federal Government in connection with the establishment, maintenance, and operation of such a program, will be repaid from rider charges paid by participating officers and employees; and

"(C) requirements to insure that each person operating a van pursuant to a van pooling arrangement authorized thereunder—

"(i) shall be a regular, full-time Government officer or employee;

"(ii) shall maintain the van in good and safe working order;

"(iii) shall be by law entitled to operate the van in his place of residence, except that nothing in this subparagraph shall be deemed to require that such person be licensed to operate the van for hire; and

"(iv) shall, in the event that such person is authorized to operate and operates the van for personal use, secure and maintain at such person's

expense insurance against such risks as the Administrator of the General Services Administration deems necessary to assure payment of any claim that may arise other than in van pooling use.

"(4) For the purposes of section 5 of the Act of July 16, 1914 (chapter 141, 38 Stat. 508, as amended; 31 U.S.C. 638a), and section 601 of Public Law 94–91 (89 Stat. 458; 31 U.S.C. 638c), a van obtained for the purpose of, and operated pursuant to, a van pooling arrangement established pursuant to this subsection shall not be deemed to be a passenger motor vehicle.

"(5) Neither the offering of a van pooling arrangement pursuant to this subsection nor the operation of a van pursuant to such an arrangement shall subject any person to regulation as a motor carrier under part II of the Interstate Commerce Act (49 U.S.C. 303 et seq.), or to any similar regulation under the laws of the District of Columbia or any State or political subdivision thereof.

"(6) Sections 1346(b) and 2679 of title 28, United States Code, shall apply to suits arising from van pooling use.

"(7) The operation of a van pursuant to a van pooling arrangement established pursuant to this subsection shall not be deemed to be operation of a motor vehicle for hire for purposes of any law of the District of Columbia or any State or political subdivision thereof relating to the licensing of

operators of motor vehicles for hire.

"(8) Time spent traveling in van pooling arrangements shall not be considered Federal employment for the purpose of any law administered by the Civil Service Commission or by the Department of Labor pursuant to chapter 81 of title 5, United States Code, and rider charges paid the operator of a van pool shall be deemed fees paid to and received by individuals in their private capacity.

"(9) The Administrator of the General Services Administration, with the approval of the Administrator, is hereby authorized to delegate to the heads of Federal departments and agencies whose officers and employees are authorized to participate in van pooling arrangements established pursuant to this subsection such of his functions, powers, and duties as he deems necessary or appropriate to establish, maintain, or operate van pooling programs authorized by this subsection.

"(10) For purposes of this subsection, the term 'van pooling use' means operation or maintenance of a van by an officer or employee of the United States in the course of or incidental to a van pooling arrangement authorized under this subsection, excluding any personal use permitted under paragraph (2) (D) (i).

"(11) All rider charges and other receipts from the operation of vanpooling arrangements established pursuant to this subsection received by the Administrator of the Gen-

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eral Services Administration or by the head of any Department or agency exercising authority delegated pursuant to paragraph (9) of this subsection shall be deposited in the general fund of the Treasury of the United States.

"(12) There are authorized to be appropriated to the Administrator such sums as may be necessary to carry out all provisions of this subsection. The Administrator shall be authorized, with the approval of the Director of the Office of Management and Budget, to transfer to the Administrator of the General Services Administration such amounts from the sums so appropriated as may be necessary to carry out the functions, duties and responsibilities assigned to the Administrator of the General Services Administration by this subsection.".

Subpart 2—Amendment to Section 381 of EPCA

SEC. 721. Section 381 of the Energy Policy and Conservation Act is amended by adding at the end thereof the following new subsections:

"(e) The plan developed by the President pursuant to subsection (a) (2) shall be applicable to Executive agencies as defined in section 105 of title 5, United States Code, and to the United States Postal Service.

"(f) In addition to funds authorized in any other law, there are authorized to be appropriated to each executive agency, as defined in section 105 of title 5, United States Code, and to the United States Postal Service, for each fiscal

year of the eight fiscal year period ending September 30, 1985, such sums as may be necessary to carry out the purposes of subsection (a) (2).".

Subpart 3—Demonstration of Solar Heating and Cooling in Federal Buildings

DEFINITIONS

SEC. 741. As used in this subpart—

(1) The term "agency" means—

(A) an Executive agency as defined in section 105 of title 5, United States Code; and

(B) each entity enumerated in paragraphs (B) through (H) of subsection (1) of section 5721 of title 5, United States Code.

(2) The term "building" means any structure (other than a residential dwelling) owned by the United States or any agency, including any such structure occupied by an agency under a lease-acquisition agreement under which the United States or an agency will receive fee simple title under the terms of such agreement without further negotiation.

(3) The term "solar heating" means with respect to any building, the use of solar energy to meet all or part of the heating needs of such building (including hot water), or all or part of the needs of such building for hot water (where its remaining heating needs are met by other methods).

(4) The term "solar heating and cooling" means with

respect to any building, the use of solar energy to provide all or part of the heating needs of such building (including hot water) and all or part of the cooling needs of such building, or all or part of the needs of such building for hot water (where its remaining heating needs are met by other methods) and all or part of the cooling needs of such building.

(5) The term "solar energy equipment" means equipment for solar heating and solar heating and cooling.

(6) The term "Administrator" means the Administrator of the Federal Energy Administration.

FEDERAL SOLAR PROGRAM

SEC. 742. The Administrator shall develop and carry out a program to demonstrate the application to buildings of solar heating and solar heating and cooling technology in Federal buildings.

DUTIES OF ADMINISTRATOR

SEC. 743. (a) In exercising the authority provided by section 742, the Administrator shall—

(1) solicit and consider proposals by any agency to apply solar heating and solar heating and cooling technology to any existing or proposed building;

(2) promulgate, by rule, criteria by which such proposals will be evaluated, which criteria shall provide for the inclusion in each proposal of a complete analysis of the present value of the costs and benefits of the pro-

posal to the agency, and for the demonstration, to the maximum extent practicable of innovative and diverse applications to a variety of type of buildings of solar heating and solar heating and cooling technology, and for location of demonstration projects in areas where a private sector market for solar energy equipment is likely to develop;

(3) evaluate each such proposal pursuant to the criteria promulgated pursuant to subsection (a) (2);

(4) provide assistance by interagency agreement for the cost of implementing a proposal (which costs shall be limited to design, acquisition, construction, and installation of solar energy equipment); and

(5) provide, by rule, that agencies report to the Administrator periodically such information as they acquire respecting maintenance and operation of solar equipment.

(b) In carrying out the responsibilities, pursuant to paragraphs (2) and (3) of subsection (a), the Administrator shall provide an opportunity for consultation to the Administrator of the General Services Administration and the Administrator of the Energy Research and Development Administration.

TRANSFER OF APPROPRIATIONS

SEC. 744. In carrying out a proposal for which the Administrator has provided assistance, any agency may use

funds transferred to it by the Administrator to enter into such contracts as may be necessary to complete the project described in that proposal.

SUBMISSION OF PROPOSALS

SEC. 745. (a) Each agency responsible for the construction of new buildings or operation of existing buildings shall, within one hundred and eighty days after publication of criteria under section 743 (a) (2), submit initial proposals to the Administrator for installation of solar energy systems on selected buildings under its control.

(b) Such initial proposal shall include a list of the specific buildings proposed to be provided with solar energy systems, the funds required for the system, the proposed implementation schedule, the estimated savings in fossil fuels and electricity, the estimated payback time, and such other information as may be required by the Administrator.

(c) Thereafter, each agency may submit proposals to the Administrator for additional solar energy systems for buildings under their control on a schedule established by the Administrator but not greater than two-year intervals.

AUTHORIZATION

SEC. 746. There are authorized to be appropriated to the Administrator through fiscal year 1980 to carry out the purposes of this subpart not to exceed $100,000,000.

The CHAIRMAN. We have, heading up our witness list this morning, Mr. David J. Bardin, Deputy Administrator of the Federal Energy Administration. Mr. Bardin, suppose you take over. You have your colleagues with you. You may wish to introduce them and you may proceed in your own way.

We are delighted to welcome you.

STATEMENT OF HON. DAVID J. BARDIN, DEPUTY ADMINISTRATOR, FEDERAL ENERGY ADMINISTRATION, ACCOMPANIED BY ROBERT HEMPHILL, OFFICE OF CONSERVATION POLICY

Mr. BARDIN. I am delighted to be back with this distinguished committee to discuss a very important part of our national energy program.

I am accompanied by Mr. Robert Hemphill, the Director of the Office of Conservation Policy of the Federal Energy Administration and one who for many years has worked with the Congress to develop these conservation programs we are discussing today. Mr. Hemphill will stay for the panel discussion as the Federal Energy Administration representative and will be available for any detailed questions you may have.

Mr. Chairman, I have a prepared statement which is fairly lengthy. With your permission, and in the interest of time, I propose to have it introduced in the record as if read and to highlight the principal issues.

The CHAIRMAN. That will be fine. The entire statement will go in. You may summarize and proceed in your own way.

I wanted to mention it is a good conservation day, it is the longest day in the year. It is a good day to start our conservation hearings.

Mr. BARDIN. The context in which we are discussing conservation——

Senator HANSEN. It sounds like you are talking down an empty barrel.

Mr. BARDIN. That is a good way of stating the problem. If we do not work together to conserve energy, the problem our country will confront will be the empty barrel. As we have consumed more and more energy and failed to produce more of it domestically, we have developed a gap which we fill with imports.

Last year, we imported 42 percent of the oil we used in this country. Conservation is one of the most effective devices we can use to come to grips with the problem. The programs we will discuss today are estimated to produce conservation savings of 1,250,000 barrels of oil a day by 1985. That would be roughly this much.

[Mr. Bardin was indicating.]

Mr. BARDIN. We imported 8.3 million barrels of oil a day last year.

The CHAIRMAN. How many barrels a day are you talking about that we are currently consuming, 18 or 19 million?

Mr. BARDIN. Last year it was 17 million, Mr. Chairman. With the cold winter, it shot up in the first 3 months of this year and it looks like average daily consumption will be significantly more than 17 million barrels.

The CHAIRMAN. The first quarter was 19 million barrels a day.

Mr. BARDIN. I think that is correct.

Conservation is the cornerstone of the national energy plan. It means more efficient and temperate use of energy resources and cuts down the risk of curtailment. Conservation saves resources so we can protect our real standard of living. Conservation can lead to a higher quality of life.

President Carter's conservation program does not seek to reduce energy consumption in absolute terms. It will not result in economic dislocations nor in loss of jobs. Indeed, it is going to create many new jobs, tens of thousands of jobs, to do what has to be done to conserve energy.

The President's conservation program does, however, seek to lower our rate of increase in energy consumption, reducing it from the average 3.5 percent that prevailed in the period 1959 through 1973 to within 2 percent in the period leading up to 1985.

As the Chairman has pointed out, Congress has repeatedly called for the development and implementation of conservation programs. This is reflected in the Federal Energy Administration Act of 1974, the Solar Heating and Cooling Demonstration Act of 1974, the Energy Policy and Conservation Act of 1975, and the Energy Conservation and Production Act of 1976.

The program proposed to you today would build upon the programs initiated, and developed by these acts of Congress. The proposals before you today, coupled with the related tax credit proposals contained in S. 1472, to be considered by the Finance Committee, have a potential for savings of 1¼ million barrels of oil a day by 1985.

The first portion of the program deals with existing residences. There are 74 million households in the country which consume 23 percent of the Nation's energy. Most of these housing units were built at a time when, because of energy prices and prevailing standards of construction, the built-in level of insulation and conservation was relatively low.

We believe an effective rehabilitation or effective retrofit program for these existing houses can attain energy savings equivalent to 520,000 barrels of oil a day by 1985. Critical to the attainment of this goal is the utility energy savings program which appears in part A, subpart 1 of S. 1469.

In essence, the National Energy Act proposal would have the electric and gas utilities of the United States undertake, on behalf of the national interest, to help the American householder conserve energy and at the same time hold down his or her high fuel and utility bills.

Under the utility energy conservation program, the gas and electric utilities would be required to provide a convenient energy conservation and information service, and to offer, at the option of the householder, the installation of specific conservation measures as well as financing arrangements to be paid back through the regular monthly utility bill.

More specifically, under the proposal, utilities would have to offer no later than January 1, 1980, the following three services.

First: They would be required to inspect the residence of each customer and provide energy conservation costs and savings information.

Second: They would have to arrange to install, normally through subcontractors, specified conservation measures, if the householder desired that service and to provide a list of all other businesses in the area who could do the work.

Third: The utilities would arrange financing for these investments through additions to the utility bill, again, if the customer so desires, and would provide the customer with a list of all competing, qualified lenders in the area.

Let me emphasize two points. The proposed program would be mandatory as to the utilities. They would have to roll up their sleeves, pitch in and perform these services. At the same time the proposed program would be strictly voluntary as to the householder. He could take advantage of the service or could decline such service. The householder could do his own do-it-yourself insulation. He could turn to a private contractor of his choice without regard to the utility. He could turn to his fuel oil dealer for the same kind of assistance if the fuel oil dealer wants to provide it.

I should report there are some fuel oil dealers in the country who are providing some of these services to their customers today and that there are also progressive electric and gas utilities in the country that are performing such services for their customers.

In the administration proposal, we will have some deliberate overlap. A single household might be approached by its gas utility, and by its electric utility, and conceivably, by the fuel oil dealer as well. This overlap is all to the good.

I think you will agree we have an extremely serious problem on our hands, that deserves early and thorough attention. It will take many approaches and a good deal of information and choice for American householders to achieve the difficult goal which President Carter's national energy plan sets before us, the goal of retrofitting homes to the point where 90 percent of all household units achieve acceptable energy conservation standards.

Senator METZENBAUM. Ninety percent of what kind of units?

Mr. BARDIN. The goal is to have 90 percent of the single-family and dual-family housing.

Senator METZENBAUM. When you talk about retrofitting, are you talking only about insulation, or are you talking about mandatory changes with respect to gas, pilot lights, other kinds of things that can be done alone?

Mr. BARDIN. At this point we are talking only about facilities that go with the structure itself. Insulation, storm windows, caulking, and the burner of the furnace, that kind of facility. There is a list of steps—and pilot light replacement is one of them—which are to be selected amongst.

Under the mechanics of the bill, the Federal Energy Administration, or the Department of Energy, will develop an appropriate list of conservation measures for each climatic region and building type in the country.

Studies indicate that conserving households could achieve reductions in their use of energy for heating and cooling of about 35 percent. This would amount to a 20-percent reduction in the typical total household energy use.

So at a time of rising prices per unit of electricity, per unit of oil or of gas, here is a chance to help the American householder constrain that bill by reducing the number of kilowatts, the number of gallons, the numbers of cubic feet that he consumes.

For the middle- and upper-income American households—the taxpaying sector—the tax credit feature, which is in S. 1472 before the

Finance Committee, will complement the provision I have described. For the lower-income American home, for which the tax credit will not be effective, there is the weatherization grant program which also involves retrofitting.

The weatherization program was created under title IV of the Energy Conservation and Production Act. The National Energy Act proposes to expand the authorized funding with an additional $65 million in 1970, $120 million in 1979, and $200 million in 1980.

This program pays for materials plus some tools. FEA is currently endeavoring to obtain Comprehensive Employment and Training Act labor to install weatherization materials.

The House Committee on Banking, Finance and Urban Affairs has voted to increase the income eligibility level for this weatherization program from 100 to 125 percent of the OMB poverty guidelines. The administration agrees with this change, if flexibility is provided to the Administrator of the FEA to insure we do not provide both a tax credit and weatherization to the same individual. It should be an either/or proposition.

Senator METZENBAUM. Would you tell us the poverty level figure, roughly, not for each grouping but for a family unit?

Mr. BARDIN. The figure is $5,800 a year for family of four.

Senator METZENBAUM. Thank you.

Mr. BARDIN. The Energy Conservation and Production Act of 1976 directs the Secretary of Housing and Urban Development to develop performance standards for new buildings not later than August 1979. The standards are to become effective at the State level no later than February 1981.

President Carter has directed the Secretary to accelerate that schedule by 1 year. Section 131 of the National Energy Act proposes to increase the existing authorization of funds to the Secretary of HUD by $25 million to make grants to States in fiscal years 1977, 1978 and 1979 to help train State officials who will implement these standards, and to ease the burden on the States of meeting the accelerated performance standards schedule.

We estimate that we may obtain a savings of as high as 400,000 barrels of oil equivalent a day by 1985 by implementing the new building standards. In a recent study done in Arkansas, it was discovered that the difference between the kinds of poorly insulated, poorly constructed housing that had been authorized for FHA funding under the old standards of construction, and the best insulation that is available with construction technology today, implies a potential saving of 73 percent on the heating and cooling energy consumption for that kind of housing and the climate of that region of the country.

Senator METZENBAUM. What is the mechanism used to effectuate the standards set by the Secretary with respect to new buildings?

Mr. BARDIN. The mechanism would be the building code enforcement personnel at the State and local level.

Senator METZENBAUM. How does the Federal Government make that a part of the local governmental obligation?

Mr. HEMPHILL. Senator, title III of EPCA requires that local governments, local jurisdictions, adopt the new national Federal standards. If they do not, then Federal officials are prohibited from providing Federal assistance to that particular jurisdiction until they have adopted those standards.

Perhaps someone from HUD would like to comment on this. The standards will not go into effect until there is an affirmative action by both the House and the Senate, to refrain from vetoing those standards.

Senator METZENBAUM. Affirmative action to keep from vetoing?

Mr. BARDIN. It says the Secretary of HUD's mechanism for getting that working, assuming the restraint, could be a very powerful mechanism.

Now, turning to home appliances, which I referred to previously as portable appliances, here, again, we propose an amendment. We need to strengthen an existing program mandated by the Congress in the Energy Policy and Conservation Act of 1975. There Congress made several important judgments.

First: That consumers lacked adequate information on the estimated operating costs of products.

Second: That significant improvements in the energy efficiency of consumer products were attainable.

Third: That consumer education was needed to support the value of life cycle costing and comparison shopping, in contrast to looking at the first cost alone.

As to the second point: You will find attached to my prepared statement a list of appliances and the potential for energy efficiency savings involved in each.

Part III of the 1975 law encourages the design and manufacture of more efficient products by establishing energy efficiency improvement targets, and requires the labeling of such information. The mechanism for actually establishing performance standards by Federal regulation is, however, cumbersome and involves delays.

The program before you today, proposed in the National Energy Act, would expand the existing authority, and would provide for the prescription of minimum efficiency performance standards as soon as possible.

We would authorize the prescription of performance standards for seven of the major appliances, products which account for 85 percent of the energy used in American households, as soon as possible. We will continue to prescribe performance standards for other appliances, not initially on the list, as we determine that they are energy inefficient.

Test procedures would have to be described for a product before a standard for that product can be established. The FEA expects to complete the process of prescribing test procedures by the end of this year. Thus far, the test procedures standard for room air conditioners has been completed and a number are underway for the remaining appliances.

Fourth: The standards must be economically attainable and uneconomically justified.

Five: Smaller manufacturers can be given a delay for up to 2 years to avoid any lessening of competition.

Six: The improvement target system would be eliminated as would the requirement that labels be in place 18 months before specific standards may be prescribed.

The principal question which has arisen with regard to this appliance section in the hearings in the other body is one of preemption of State standards. The administration recommends the retaining of the formula that is now built into the existing Federal law.

Under that formula, before the period the prescription of a Federal standard, a State may act to fix its own energy efficiency standards unless a manufacturer demonstrates to the Federal Energy Administration that the State standard is unnecessary to meet a legitimate State purpose and imposes an undue burden on interstate commerce.

Senator METZENBAUM. Would you repeat that?

Mr. BARDIN. Under present law, in the period before the Federal Government has acted to prescribe the Federal standard, and that is the period we are in today for all of the standards in question, the substantive standards for all of the testing procedures, except for room air-conditioners as I mentioned, the State can go ahead and prescribe the State's own energy efficiency standards for appliances sold in that State.

California, for instance, has done so. A manufacturer may come to the FEA and ask for relief from the State standard, but in order to get that relief from the State standard, the manufacturer must demonstrate two things:

One: The standard prescribed by the State does not carry out a legitimate State need.

Two: The standard unduly burdens interstate commerce.

That question has been raised to the FEA in a couple of cases and in each of those instances, the FEA has rejected the manufacturer's petition and allowed the State standard to remain in effect.

What happens after the Federal Government imposes the standard? At that point, under present law, the burden shifts. A State would have to justify its having a standard of its own under those circumstances and only a more stringent standard would be allowed.

Moreover, once the Federal standard becomes effective, that will be the standard governing the appliance.

Senator METZENBAUM. Mr. Bardin, if you are totally successful in the program with respect to the mandatory aspects, the mandatory standards which are applicable to 80 percent of the energy used in the home, as I understand it, the impact would still be rather modest; 220,000 barrels a day for a total of how many? Do you understand my question?

Mr. BARDIN. If we carry out the entire program, the impact is estimated to be 220,000 barrels a day by 1985. Keep in mind one of our problems is the turnover or lifespan of these appliances, which is about 15 years. It is longer, say, than the average car turnover situation, but the number you give is correct. That is our best estimate.

Senator METZENBAUM. And you consume how much in the home, about 4 million barrels a day?

Mr. BARDIN. Homes consume about 23 percent of the total consumption.

Senator HANSEN. I think the terms you had earlier, in terms of fuel equivalency, was 8.3 million barrels.

Mr. BARDIN. Senator Hansen, we are talking about oil equivalency. In the numbers I am using, it is not factual number of barrels, it is the Btu equivalency, 8.3 million barrels a day. About two-thirds would be space and water heating; one-third would be appliances and lighting, roughly.

Senator HANSEN. I believe on page 3 you have that. Fully three-quarters of this goes to water heating, space heating, and cooling.

Senator JOHNSTON [presiding]. Mr. Bardin, I don't want to cut you off at this time, but we have to plan to follow a time schedule till 7:45 a.m., and we want to allow time for questions.

Mr. Bardin, you state you would require utilities to inspect homes, to provide home consultation service, to arrange financing, and provide a list of qualified contractors. Who will determine their qualifications?

Mr. BARDIN. The utility will be responsible for doing that under ground rules that would be set normally by the State public utility commission. The concept of the bill is if there are general guidelines by the Federal Government, the State PUC which knows the utility best and knows the local conditions, such as the local climate and other factors, will be the actual regulatory agency. The utility would be the implementer.

Senator JOHNSTON. I would suggest to you this would be a very powerful stimulus for business, to have this utility saying; Joe Smith is a qualified U.S. Government insulation contractor. We recommend him, under guidelines of the Federal Government.

What I am saying to you is, it seems to me a better way to do that would be to have these people qualified, as they are, by HUD, FHA, or some agency like that, people who are experienced in the field. If you are going to be promoting these people as government contractors, you are going to have to have some control—for example, cost control.

Suppose a fellow is a good contractor, but charges twice the amount that would be necessary to do a given job. Who determines that he loses his qualification?

Mr. BARDIN. I think we have a problem here. We are all sensitive to it—in arriving at the solution, you want to enlist the greatest talents you have. I would keep in mind the following: The contractors in question are basically local contractors. We, in Washington, don't really know who are the right people. Whoever does it, it should not be done by someone in Washington; it should be done by someone in the community where the contractors work and can be judged.

Two: You had an analogous problem back in the 1950's on another kind of home improvement which led to the formation of the National Home Improvement Council under President Eisenhower. The National Home Improvement Council has indicated they want to be helpful to the Government agencies in working on that problem, and so do other better-business-type business organizations.

Three: We want guidelines to make sure there isn't any undue competitive advantage to be written into this program as part of the regulatory system. But without knowing the resources of HUD, and I will defer to them in their panel discussion with you, I would doubt whether we would really want to go to the point of the Federal Government certifying that Joe Smith is a good contractor.

Senator JOHNSTON. You are requiring the utility to provide a list of qualified contractors. Qualified under what? They are going to bear this U.S. Government stamp of approval, yet apparently they are not going to have any control at all.

Mr. BARDIN. I don't think it would be the U.S. Government stamp of approval. That is the distinction I would make. The utilities now running such programs come up with names. Whether they are ex-

haustive lists is a good question; whether the list should be longer is a good question.

But our theory is that the program is so important in terms of the national interest—the national energy conservation effort on one hand, and the householder's pocketbook on the other—that we should try to make a diversity of sources of help available to them.

I would hope the system would be one in which the utility consults the Better Business Bureau and others in that community to come up with the right list for Shreveport, and the right list for Cheyenne, and the right list for Cleveland.

Senator JOHNSTON. The right list, according to your statement, is going to be determined by that utility without any government control at all. Indeed, the qualified contractor might be the brother-in-law of the president of the utility and he might charge twice as much as anyone else, yet he is listed as the only one qualified. He is written on the list of qualified U.S. Government contractors. I don't want to belabor the point.

Mr. BARDIN. The only control we propose is control in the form of guidelines and regulations. We say here is how you do it. The regulation could say do not represent the list as U.S. Government certified contractors, and it could also say something about favoritism. That does not answer your concern, which is a legitimate one, but we do want to be careful about using the Government label.

Senator JOHNSTON. Under State standards, you say between now and the time the Federal standards are coming out—when are those Federal standards coming out?

Mr. BARDIN. The law simply says as soon as possible after the test procedures are completed. The test procedures are being completed week by week for various appliances during the course of this year. We would hope in the first and second year after enactment, we could do the job of putting out the Federal standards.

Senator JOHNSTON. You say State standards will prevail unless they can first show there is not a legitimate State need. Does the State have a legitimate need in describing standards for efficiency?

Mr. BARDIN. For reasons of conservation, we think they do.

Senator JOHNSTON. Let's say the first State that comes out with a standard, they come out with a standard that may or may not be different from what the Federal Government would come out with, is that a new burden in interstate commerce?

Mr. BARDIN. In the case of the California standards which were imposed, there were a couple of appeals to the FEA. I am not personally familiar with them, but I understand the FEA Administrators simply concluded a showing had not been made of an undue burden on interstate commerce.

Senator JOHNSTON. Suppose you knew the State standard was going to be different from the Federal Government? Let's say the Federal Government is going to require 70-percent efficiency. Take a number the State is going to require, something more. Does that not, ipso facto, constitute a burden on interstate commerce?

Mr. BARDIN. I think I would have to evaluate these cases individually, Senator. I don't know how, offhand, we would know in advance——

Senator JOHNSTON. You say some of these things——

Mr. BARDIN. Maybe I did not make myself clear. The first step is to prescribe a testing procedure and then to arrive at a standard. One of the salutary features of the law you passed 2 years ago is that you say, let's get the testing ground rules written, in some of the other fields we know about, some of the air pollution fields, for example. They set the standards first and then argued about the test to see if the standards had been met or violated.

Here we are trying to see that the ground rules for testing the appliance are fixed. That is what we are finishing up this year.

Senator JOHNSTON. I won't belabor it because my time is up, but it seems to me, and I guess this addresses itself to us rather than you, we ought to provide uniformity in Federal standards. I can see a crazy quilt of regulations across the country and appliance manufacturers not knowing how to react.

Mr. BARDIN. Under present law, the appliance manufacturers have several problems. One is a present squeeze down of collectively all of the manufacturers of a given appliance, it does not relate to the individual manufacturer. For that dishwasher or whatever we are talking about, we do want a practical regulatory scheme we can implement quickly, which manufacturers can react to decisively.

Senator HANSEN. On page 10, you say the House Committee on Banking, Finance, and Urban Affairs is going to increase the income eligibility level from 100 percent of the OMB poverty guidelines to 125 percent.

My question is: What percent of the estimated cost of retrofitting an average home with storm windows, insulation, and so forth, would this be? Would you have an idea of the estimated cost of a job? Someone qualifying under this OMB poverty guideline would receive.

Mr. BARDIN. This is just a question of eligibility for the weatherization program. It does not have to do with the cost of the job. It has to do with the eligibility of the family.

The feeling of the House committee was that the poverty guidelines are such that you would have families paying little or no income tax and who would simply not be reached by the investment tax credit, that most of us could benefit from. The House committee thought there was a gap in our program and we accepted their view as long as there isn't double dipping.

Senator HANSEN. Let me ask you another question. Suppose someone is just over the poverty guideline: What percent would you estimate, given an average condition? I realize that might be difficult to ascertain, might a person receive what percent of the improvements he would be expected to make?

Mr. BARDIN. In the weatherization program, Senator, the total cost is supposed to be covered by that program.

Senator HANSEN. The total cost?

Mr. BARDIN. The total cost.

Senator HANSEN. If the bill is $750, he could get $750?

Mr. BARDIN. The average is closer to $200.

Senator HANSEN. You are not going to get very much of a program for $200; are you?

Mr. BARDIN. These are limited programs.

Senator HANSEN. I realize that.

Mr. BARDIN. The labor, typically, comes free from the CETA program. Free is the wrong word for it, it is being paid under a poverty employment program. The program is run through grants to the State and grants to community organizations and there are ground rules and guidelines as to what they can use it for and they use it for the very highest priority items which can be done quickly with that kind of labor.

Senator HANSEN. Would the $200 be intended to pay for the cost of materials?

Mr. BARDIN. Basically materials, yes.

Senator HANSEN. You think that will come close—your goal is to insulate 90 percent, I think you said in response to a question asked by Senator Metzenbaum. Your goal is to retrofit, winterize, caulk, and so forth, 90 percent of the homes.

Mr. BARDIN. That is correct, Senator.

Senator HANSEN. Is it realistic to expect $200 will pay for the materials necessary to achieve a reasonably good job? I should point out 90 percent of the homes are not going to be on the poverty level, but for those that are.

Mr. BARDIN. The $200 is an average, it includes different climatic regions and different building types. It includes rural houses that have less of an insulation problem, isolated houses. We think the program has the makings of a success in it.

Whether we are going to reach that 90 percent target nationwide by 1985 is an issue which has been raised. The Treasury has made some alternative calculations which suggests perhaps we won't make it that fast. The Congressional Budget Office has also questioned our reaching the target.

Our position is, quite frankly, that we really don't know until we get started rolling up our sleeves and doing some of these things.

As we get started with the program, we will have much better figures to report to you and to OMB and we will have to decide together, by the usual process of government, whether more things have to be done voluntarily through the use of incentives or whether they should be mandated to achieve the goal we are trying to reach. We are convinced our proposals will make substantial progress in the right direction and we hope we can achieve the goal.

One of the things we are counting on, which no computer computes for us, is the human reaction of individual Americans. We think people respond to a challenge when they perceive and understand a challenge, when they see what is happening, and understand the vulnerability of our country, and understand there are ways in which the ordinary American man and woman can roll up his sleeve, help his country, and help control his fuel bill.

We think there may well be a response which is much more positive than the computers tell us.

Senator HANSEN. As income levels rise, when you consider the impact of the program on the population, I would assume there would be a greater enthusiasm in participating as people can relate the costs of expenditures to savings in fuel.

I would think the difficulty, the crunch is going to come in the lower brackets and particularly in those homes where the occupant is not an owner. But it seems as though $200 wouldn't buy very much. Have

you any figures on what you estimate? You say the labor will be provided by a CETA program?

Mr. BARDIN. That is the arrangement we are working out.

Senator HANSEN. Could you provide for the record, your best estimate of what the total cost to the Government will be for the materials and the supplied labor?

Mr. BARDIN. I would be happy to, Senator. The formula for allocating to the States weatherization funds takes into account, among other things, the climate differences. You have very cold States, States where buildings need a great deal more insulation because of the inherent characteristics of the area and that is supposed to be reflected in what actually gets into the individual structures.

Senator JOHNSTON. If you want CETA to do that work and not the Community Services Administration, the Senate Appropriations Committee just added money to the CSA program yesterday. It is going to conference, it would be appropriate for you to get in contact with them.

[Subsequent to the hearings, the following letter was received for the record:]

FEDERAL ENERGY ADMINISTRATION,
Washington, D.C., July 8, 1977.

Hon. J. BENNETT JOHNSTON,
Chairman, Subcommittee on Energy Conservation and Regulation, Energy and Natural Resources Committee, U.S. Senate, Washington, D.C.

DEAR BENNETT: You were good to point out, during the June 21 conservation hearing, that the Senate Appropriations Committee adopted a measure to increase to $65 million the fiscal year 1978 funding of the Community Services Administration's (CSA) Emergency Energy Conservation Services Program. The House passed version of the Labor-HEW Appropriations bill contains a $45 million allocation to CSA for this purpose. This CSA poverty relief program includes weatherization services similar to those FEA will provide under the Energy Conservation and Production Act of 1976 (ECPA), which authorized $200 million for weatherization for fiscal years 1977–1979.

The Administration is strongly committed to a low income housing insulation and weatherization grants program that will not only assist the poor by reducing their fuel bills, but will also result in substantial energy savings. Accordingly, the National Energy Act proposes to expand the FEA weatherization program by $385 million for fiscal years 1878–1980.

FEA is currently negotiating with the Department of Labor to obtain Comprehensive Employment and Training Act (CETA) labor to install weatherization materials. CSA has been successful in obtaining CETA labor at the local level to install materials for its weatherization program. FEA believes that the work to install materials for the larger FEA porgram will also be supplied through this practical application of resources that the Congress has already provided.

Under the existing ECPA authority, FEA received an initial appropriation of $27.5 million on May 4, 1977. We hope to be able to make weatherization awards to some States as early as August 30, 1977, and expect to make all disbursements by the end of September.

FEA estimates that with this initial funding of $27.5 million, 115,000 dwelling units could be insulated prior to next winter at an average cost of $210 per unit. At this rate we project a savings of over 300,000 barrels of oil this year, and much greater savings as additional homes are weatherized later. Householders whose homes are weatherized can expect a reduction of $35 in their heating bill for this coming winter alone.

With highest personal regards, I remain,

Sincerely,

DAVID J. BARDIN,
Deputy Administrator.

Senator METZENBAUM. The problem I have with the program is not the thrust of it, the concern I have is backup information. Do you assume there will be—if you get 10 percent, I think that could just as well happen. We have a 55-mile-per-hour speed limit on the highway, you don't have 10-percent compliance there even though people know they can save on their gas bill. The concern I have is the President's program which is to be the moral equivalent of war, in my opinion, really relies totally on being certain we don't inconvenience the American public.

If you want to achieve your objective, why hasn't the administration come forward with mandatory applications? For example, we have bank lighting in this country, the World Trade Center, you have to light the whole floor or you light no portion of it. You could have the mandatory elimination of pilot lights. The administration could do this this morning, if they would just do it, by sending out a directive to every gas company in this country urging them to eliminate immediately all of the gas pilot lights that go 24 hours a day outside people's homes.

You could have mandatory coal conservation. You could change fleet averages to individual limitations and restrictions. I just think we are talking about "pie in the sky" when we somehow think by making it possible for the utility to provide financing, and to add it on to the bill, than to sell the ideas, be persuasive. I would like to see some evidence that people will do that, which you hope they will do on a voluntary basis as distinguished from a mandatory basis.

I, for one, would be prepared to support mandatory conversions, mandatory obligations. I believe in my President; it is the moral equivalent of war to conserve energy and yet his program, in my opinion, doesn't go that far.

Mr. BARDIN. There is going to be a hearing shortly, I hope, on the rate design features of President Carter's bill dealing with both electric utility rates and gas rates. I hope I will have a chance to testify before you on that. Our proposals on master metering go right to the bank lighting you have in mind.

The proposals before you today are suggestions which are pretty critical. There are mandatory for the utilities. This portion of the bill would require things of the utilities.

I am also concerned that if we had a strictly voluntary program, we would find strictly 10 percent of Americans going to the utilities seeking financing, taking the advice, and that is the end of it. We don't propose it be voluntary with the utilities, and I say to you, gentlemen, don't let the utilities off the hook.

I understand the fuel oil dealers are nervous about possible competitive effects. I understand Members in the other body are concerned about giving the utilities too much of an opportunity, but the fact is the utilities are located as a fixed, responsible, known organization in every community in this country.

When you look at what is happening to gas bills, and oil bills, and electric bills, jumps in cost just last winter, data we have——

Senator METZENBAUM. You don't have to convince me.

Mr. BARDIN. In Columbus, Ohio, for instance, there was a 62-percent increase in the price of natural gas for the average residential customer last December over the previous December. With only a 21-percent

increase in consumption, these consumers suffered a 62-percent increase in cost. This information comes from a study made through the good auspices of the National Association of Regulatory Utility Commissioners.

That pattern gets repeated around the country. If these programs, which we hope you will initiate in 1977, does not do the job, then there are opportunities to review the programs and revise them in due course.

Senator METZENBAUM. The House added a provision for houses to be insulated at the point of sale. Does the administration favor this provision?

Mr. BARDIN. The administration has not completed its study of that provision. We have proposed a provision which calls on utilities to begin getting the message and the services across no later than the beginning of 1980.

The House provision in question, as I recall, calls for a trigger in 1982, I believe, perhaps later. I believe it is 1982, that is really a question for the future.

Senator METZENBAUM. Would the administration support the mandatory requirement of mandatory insulation at point of sale now?

Mr. BARDIN. I am not in a position to give you a final answer on that question. But the administration has thus far not endorsed that provision.

Senator METZENBAUM. Would you respond to me and members of this committee in writing as soon as possible, not for 1982, now; the moral equivalent of what war, remember?

Mr. BARDIN. In response to your question, we seem to have citizens who are listening. I called Hechinger's yesterday to see what the situation was. They say their sales of insulation materials today are at peak levels, levels they normally reach in November. They have subcontractors whom they can assign to do the work if the customer does not want to do it himself. If you want to get it done now by a subcontractor, you have a 4-week wait.

We do have a response by American citizens. We do have to have a growth and a capacity to manufacture the insulation material.

Senator METZENBAUM. I am not going to continue on, but I want to make it clear, I read a lot about Congress not wanting to take the tough enough road. I cannot speak for 534 others, but my concern is the administration is not willing to take a tough enough position in mandatory conservation measures.

I see no evidence the administration is willing, really, to tough it out as I believe it is necessary if conservation is to have an impact in this country. I just want to make it clear, I think it is the administration's program that needs toughening up and I think some of us in Congress would be prepared to support that kind of posture.

Mr. BARDIN. I appreciate the message, Senator Metzenbaum. I hope we have a package as vigorous as the package sent up to the Congress.

Senator WEICKER. I would like to associate myself with the comments of the distinguished Senator from Ohio. The only difference I find between now and the last several years is that over the past several years, there has been no tough form and no tough substance.

As I read the administration's message, I grant you the form seems to be tough, but the substance is not. Every comment the Senator from

Ohio made as to the rhetoric and the failure of the substance to follow along with the rhetoric I consider to be absolutely correct.

Let me get into some specifics here. First of all, I appreciate your comments that we all ought to hold the utilities responsible. This follows very much in the same line of rhetoric as we all ought to hold Detroit responsible. I am sure we should to some extent. Or we ought to hold the oil companies responsible. I think that rhetoric tends to turn us away from who is responsible, which is everybody.

You have asked the utilities to go ahead and perform a function here for the Federal Government. Why, if I were a utility, should I want to go ahead and perform that function which obviously puts a great deal of responsibility on my shoulders and subjects me, frankly, to a great deal of political demagoguery.

I can already see it taking place and I am sure they already get a lot of demagoguery. Why would I want to perform this function if I am going to get clobbered over the head before I start?

Mr. BARDIN. The best answer can be seen by turning to any one of the utilities listed on the list attached to my prepared statement, who have actually gone forward without waiting for this legislation with one or more aspects of the proposal. I think you will find that what motivates these utilities is a bundle of considerations: A combination of farsightedness, patriotism, a sense of what they are up against, energy supply constraints, and a certain amount of self-interest.

Keep in mind that utilities are one of the very few industries in our country that cannot get up and move away. They are like local government, they are fixed there, they are going to be there next year.

The late Justice Felix Frankfurter once characterized them as an extension of government in our legal system, and in many ways that is what they are. It is extraordinary to ask a merchandising company to convince its customers to buy less of its product and for that reason it seems to me we owe it to the utilities to mandate that they do a job on behalf of conservation. In the last analysis, this is more practical than asking them to do it from sheer patriotism.

Senator WEICKER. But there is more than that involved, Mr. Bardin. I have not seen anything in the sense of advertising in the last couple of years that does anything but discourage the use of the product. That is not what we are talking about. We are putting some affirmative duties here on, literally, the running of an entire program.

I suppose what bothers me is you go ahead and issue a statement and say the utilities are going to be required, in effect, to run this program which is a part of President Carter's energy program. Then you come forth in the rhetoric, in the response to Senator Metzenbaum, don't let them off the hook, give it to the utilities. That is a rather strange way to go about the task. Either they are responsible or they are not. Either you want them in the plan once and for all, free of political demagoguery, or you don't.

I don't want to spend too much time on this. I come back to my initial comments. You are asking the utilities to sacrifice but you are not asking the American people to sacrifice. You are not hitting, in other words, where there could be political fallout.

Mr. BARDIN. I think that when you look at the American people paying the utility bills they pay, when you look at American school districts and see their fuel costs, which went up 50 percent since 1973, I think we kid ourselves——

Senator WEICKER. Who raised the price, the utilities or the OPEC nations?

Mr. BARDIN. The OPEC nations.

Senator WEICKER. Let's put it where it is, Mr. Bardin. Let's stop trying to find these targets out there which, in effect, enable the American people to take the responsibility off of their shoulders. It sits on all of our shoulders.

Mr. BARDIN. I agree with you, it is all of our responsibility.

Senator WEICKER. I am not letting the utilities off the hook, Detroit, or anyone else. What I am getting to is where in this program is the type of mandatory conservation that is really going to have everybody feeling uncomfortable? How about closing gas stations? How about taking the cars off the road? How about, in other words, proposals that really stick and hit? Who are the major consumers of energy? The automobile in this country is the single biggest consumer or user of energy.

Mr. BARDIN. That is us also; isn't it?

Senator WEICKER. It is us, but where is the mandatory conservation relative to the automobile?

Mr. BARDIN. We are proposing a car which is much more efficient be manufactured, and that the less efficient cars be heavily taxed. President Carter's proposal, which is not before this committee, is that a heavy tax be levied rather quickly to discourage the sales of big, inefficient cars.

Senator WEICKER. So the rich can buy the cars.

Mr. BARDIN. The Carter proposal is not designed to put a hair shirt on us, but designed to get a job done, to get some reversal in the trend of increased energy consumption which has been of more and more import, to get to a point where it is of somewhat less import.

Utilities are agencies that run on a regulated basis. You trust the utility to charge the rate the Public Utility Commission fixed for it, but you don't stop utility regulation. You don't let them charge any rate they want.

But, on the other hand, the utility company has competence which you cannot duplicate unless you want to hire a great many government officials to do the job.

Senator WEICKER. You are willing, within the rate structure, to allow the utilities the necessary funds to go ahead and conduct this program?

Mr. BARDIN. Actually we are proposing it be done by special payment to the people whose homes are to be insulated, but we don't want to take it out of the hands of the stockholders. We propose this be a self-sustaining program.

Senator WEICKER. I have no more questions. I understand you are under time constraints, but it would be my hope, there are some of us here who feel very strong about measures across the board that indeed are going to achieve conservation. It is going to be mandatory, it is going to hurt a lot more, frankly, than what is being proposed here.

Whether it is utilities, oil companies, or Detroit, I am just as fed up with them as I am with the lack of conservation across the board. It is illusory to propose that we are going to achieve a great deal of conservation with these administration programs.

Mr. BARDIN. Senator Weicker, we have a problem getting programs started, programs geared up, programs moving. Just as Congress was here before this year, it is going to be here after this year and you may amend legislation in later years.

Senator WEICKER. Mr. Bardin, for 4 years, philosophically, the Republicans in this Congress have been opposed to mandatory conservation. The Democrats have been philosophically opposed to decontrol. We have ended up with no resolution to energy programs. It is not a matter of starting this thing this minute. Somebody is going to have to bite the bullet. I was hoping that was going to be the President in his form. It seems he did bite the bullet, but the substance does not follow the form.

Senator DOMENICI. I might say, so representatives of the administration would get a feel of the collective committee, I don't know that I agree that we should have so many across-the-board, mandatory conservation items. However, it does appear to me that rhetoric is much more effective if there is some specific known sacrifice.

And it would appear to me there may be missing in the program one such sacrifice that is to be borne by all, one that is very precise and very mandatory. I don't find it in the notion that we will tax the heavy industry in America for using natural gas because I think that is going to get passed on to the consumer.

Once again, we are going to say you won't get hurt; we are going to rebates. I think we are going in a circle. Let me change the focus. The last time Dr. Schlesinger was here, we did not have this indepth program. Nevertheless, the question was asked of him: How well prepared are we to see to it that the necessary insulation materials are available, competitively?

I believe the response was, "We will monitor it." I would assume there is continual monitoring right now on the supply/demand side of insulation material. Is that correct?

Mr. BARDIN. That is correct, Senator Domenici.

Senator DOMENICI. Who is in charge of that and under what authority?

Mr. BARDIN. It is an information function certainly within the authority of the FEA under the Federal Energy Administration Act. The present planning is for the 9-year program. Manufacturers are going to be able to gear up the expansion of plants which takes 6 to 18 months; the construction of new plants takes 18 months to 2 years.

There is some concern for the short haul; the next year, or year and a half, as the manufacturer's capacity is building up.

Senator DOMENICI. Let me ask the chairman if it would be appropriate at this point to ask Mr. Bardin to supply for the record, information they have with reference to projected needs. Also, would FEA supply some information about those who can deliver the insulation to the consumer.

Let me shift again. Do you know of any communities wherein utilities are presently in the business of insulating?

Mr. BARDIN. Yes, Senator. That is to say, use subcontractors rather than their own employees, but there are examples.

Senator DOMENICI. Do you have information about how they are billing and whether they are time sales for those transactions now?

Mr. BARDIN. We can supply that.[1]

[1] See appendix I, p. 482.

Senator DOMENICI. Do you have any communities wherein the private sector, aside from the utilities, is doing the same thing? If so, do you have any comparisons of costs?

Mr. BARDIN. As to all but the last question, the answer is, yes. I doubt whether we have cost comparisons.

There is quite a variety of organizations, fuel oil dealers, and supply stores such as the one I mentioned here in the Washington area, that are engaged in that work. My guess is, when you take into account the small businessman, there are thousands around the country, but we would be happy to supply you with what information we have.

Senator DOMENICI. I assume that one aspect of your monitoring would be to get comparative prices for this type of work over a period of time, like the past 6 months. Do you have such information?

Mr. BARDIN. I don't believe the FEA has that kind of information. Maybe the other Federal agencies go into that kind of information.

Senator DOMENICI. I wonder if you could get that and supply it for the record. My hunch is that the price has gone up enormously.[2]

Mr. Chairman, I have two more questions. I regret to take so much time. Let me ask this question. It is my opinon regardless of what we do that ultimately most of the insulating work in this country to come as a result of the President's proposal for tax credits, for those who are in tax brackets and that will in turn, in my opnion at least, be most successful if maximum financing is available to the consumer. I will ask a general question.

Has the administration looked at all of the Federal programs present that guarantee direct loans and the like to see if those programs can be made to accommodate an add-on for insulation?

Mr. BARDIN. I hope we have. I believe the lead agency in that respect would probably be the Department of Housing and Urban Development who will be participating in the panel after my appearance. There is a feature in the bill that has attempted to create a market, a refinancing market, for these insulation loans, Fannie Mae and Freddie Mac.

Senator DOMENICI. With reference to whether CETA or CSA does the poverty insulation, does FEA have any thoughts about letting some other competitors get into that market so we don't have that program managed homogeneously across the United States by one agency?

Mr. BARDIN. Mr. Hemphill has a technical answer.

Mr. HEMPHILL. The Weatherization Act, under which we operate, requires us to require the States to give preference to community action agencies within the State unless the Governor makes several findings that a community action agency does not have the capability and has not done an adequate job. So by and large we are required by law to run it through community action agencies.

Senator DOMENICI. Up to this point in time?

Mr. HEMPHILL. Yes.

Mr. BARDIN. There is a possibility of competition. You have different organizations. An evaluation afterward could show that organization A or B did a heck of a good job; you might draw some useful conclusions for next year as a result of that.

[The prepared statement of Mr. Bardin follows:]

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[2] See appendix I, pp. 483–4.

STATEMENT OF DAVID J. BARDIN, DEPUTY ADMINISTRATOR, FEDERAL ENERGY ADMINISTRATOR

Mr. Chairman and members of the subcommittee, I am here this morning to present the views of the Administration on non-tax conservation provisions of President Carter's proposed National Energy Act contained in parts A, B, C, and G of S. 1469. These parts of the bill include conservation proposals for existing residential buildings, existing schools and hospitals, all new buildings, and new appliances, as well as vanpooling to and from Federal facilities and installation of solar equipment at Federal buildings.

Conservation is the cornerstone of the National Energy Plan. Conservation means more efficient and tempered use of our energy resources. Conservation cuts down the risk of curtailment. Conservation saves resourecs so that Americans can protect our real standard of living. Conservation can lead to a higher quality of life.

President Carter's conservation program does not seek to reduce energy consumption in absolute terms; it will not result in economic dislocations nor in a loss of jobs. The program does, however, seek to lower our rate of increase in energy consumption, reducing it from an average 3.5 percent in the period between 1959 and 1973 to 2 percent or less by 1985. To achieve the goal we have to increase energy efficiency throughout our economy. As a part of that effort we have to reduce the waste that results from poor insulation in homes and offices, from purchasing inefficient cars and operating them wastefully, and from the widespread use of major appliances which are much less energy-efficient than they can and should be. The sooner we are able to reduce energy waste the better are our chances of avoiding in the future brutal shortages and profound disruptions in our lives.

Congress has repeatedly called for the development and implementation of conservation programs. Section 5(b)(7) of the Federal Energy Administration Act of 1974 provides that the Administrator shall "develop and oversee the implementation of equitable voluntary and mandatory energy conservation programs and promote efficiencies in the use of energy resources." The proposals before you today build on prior Congressional initiatives expressed in the Solar Heating and Cooling Demonstration Act of 1974, the Energy Policy and Conservation Act of 1975 (EPCA), and the Energy Conservation and Production Act of 1976 (ECPA). In some areas we now propose to accelerate and expand existing programs. In others we propose similar or related new programs that will stimulate conservation activities. The proposals before you today, together with related tax credit proposals in S. 1472, to be considered by the Senate Finance Committee, will save an estimated 1,250,000 barrels of oil per day by 1985.

EXISTING RESIDENCES

Seventy-four million households in the United States consume 23 percent of our Nation's energy, or the equivalent of 8.3 million barrels per day. Fully three-quarters of this 23 percent goes to water heating and space heating and cooling. The goal of our residential energy conservation proposals is to bring 90 percent of all American households up to minimum Federal insulation standards by 1985.

We all know how much household budgets are hurt during winter months by rising home heating fuel costs. This past winter average bills across the country increased dramatically over the preceding year, reflecting higher energy costs as well as the extreme cold. Though savings will vary by climate and by the initial condition of the house, households which participate in the residential conservation program and improve their energy efficiency will save about 35 percent of their energy consumption for heating and cooling or fully 20 percent of their total home energy use.

The total energy savings potential through conservation investments in existing residences exceeds the equivalent of 500,000 barrels of oil per day. Greater attention by home dwellers to their own energy use would result in further savings. Temperature settings, equipment maintenance, and actions as simple as opening and closing windows at appropriate times each substantially affect energy consumption.

Part A, Subpart 1 of S. 1469 would establish a utility energy savings program, as a vital element of the total residential energy conservation proposals in the bill. The utility program will require the Nation's public utilities to provide a

"turnkey" conservation service, including identification, installation, and financing of conservation items.

The proposed bill would facilitate the making of loans to retrofit existing residences. It would make it possible for the Federal National Mortgage Corporation (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac) to purchase energy conservation home improvement loans from primary lenders, as they now purchase home mortgages. In addition, the National Housing Act would be amended to allow utilities to qualify as lenders under the Title I Home Improvement Program.

Our utilities program is designed to make utilities a convenient energy conservation information and service resources. Each gas or electric utility will be required to offer its customers a conservation program which meets several Federal requirements. These include provisions that would require the utility to begin to offer three services no later than January 1, 1980:

To inspect the residence of each customer and provide energy conservation costs and savings information,

To arrange to install certain specified conservation measures (normally through subcontractors), and

To arrange financing for these investments through additions to utility bills, if desired by the customer.

Owners and renters of one and two family residences would be included in this coverage, and would also be eligible for financing and for tax credits. Utilities would be required to provide lists of qualified contractors to their customers, as well as lists of alternative lenders.

To carry out the program, FEA would develop guidelines for utility conservation programs within 120 days of the passage of the Act. Utility commissions would be asked to submit plans for directing the utilities they regulate to carry out adequate conservation programs, as described above. If a regulatory commission did not submit an adequate plan, the FEA would itself direct utilities to undertake conservation programs. Nonregulated utilities, such as municipal utilities or co-operatives, would submit plans for conservation programs directly to FEA for approval. Utilities with sales below 750 million kwh or 10 billion cubic feet (for electricity and natural gas respectively) would be exempted from this requirement of the Act. We would thus require action by about 380 of the Nation's over 3000 municipal, cooperative, and privately owned utilities.

Certain other exemptions would be allowed. Any utility which had inadequate resources to finance conservation, or which was unable to arrange financing from another source, would be exempted from the requirements to offer financing. Utilities could also propose to implement alternative programs which do not meet the specific requirements of the Act if they could demonstrate that their program would be just as effective as one which did.

We have chosen utilities to be a focal point since at present, a homeowner faces a bewildering array of information sources, of separate contractors, and of lenders, who must each be contacted in trying to put together a complete conservation package. Of course, many homeowners will want to install measures themselves, since costs are lower; and they may still purchase services from private contractors and borrow from other lenders. But developing one central source of information and service is an essential element in the achievement of our goals.

Several progressive utilities have already undertaken conservation programs offering part of the services we have proposed to make mandatory. I have attached a list of such utilities. The great majority are not offering all the services which we believe must be available from one source, but their experiences to date have laid a base for future programs. Many fuel oil dealers have also offered conservation services to their customers, often as part of normal annual servicing contracts. We have proposed to let the fuel oil dealers themselves decide to offer conservation services, rather than establishing some new mechanisms to require participation. Our goal has not been to carve up the residential market by heating fuel type for the purposes of conservation programs, but rather to provide overlapping coverage in many areas. A home served by a participating electric utility but buying natural gas for heat would receive offers from both utilities for conservation services. Similarly, homes with oil heat and electric service would receive an offer of conservation services from the electric utility, but could also receive such an offer from their oil dealer.

The conservation packages offered by the utilities will vary by location and may include ceiling, wall, floor, and water heater insulation, storm windows,

clock or automatic thermostats, caulking and weatherstripping, and three specific furnace modifications. Our regulations will define the measures appropriate to various buildings and parts of the country according to climate and type of construction. For example, it does not pay to try to insulate certain types of homes or to add storm windows in certain parts of the country. We have chosen the specific measures for consideration because we believe the number of homes in which they are cost-justified to be large. (We do not deprecate private choices to use other measures.)

In addition, our regulations will cover standards for the manufacture and installation of products. We have proposed two efforts to limit the possibility of fraud in the production, sale, and installation of products. First, we will develop standards for both the manufacture and installation of materials. We will rely on ERDA and NBS for technical support in the development of these standards as well as using information from HUD and GSA. We will also work with those private organizations which are knowledgeable in this area. Additionally, State regulatory agencies will be required to develop programs for preventing unfair or deceptive activities in connection with utility home conservation programs.

We have examined the capacity of the various industries which produce the materials to be installed in homes. We have concluded that if a program to insulate homes is spread over the nine-year period we are proposing, there will be adequate incentives for manufacturers of all types of insulation to build new facilities to meet increased demand. This conclusion is based on an assessment of the needs for insulation in residences and on information from manufacturers about their ability to construct new facilities.

We have also proposed to augment the Weatherization Program for low-income Americans authorized by Title IV of the Energy Conservation and Production Act. Title IV authorizes $200 mililon in grants over a three-year period (fiscal years 1977–1979) to pay for materials such as ceiling insulation, storm windows, weatherstripping and caulking to be used to weatherize low-income homes. These funds will allow for the weatherization of approximately 1.4 million homes out of an estimated 8.6 million low-income homes. The President has proposed expanding Title IV to authorize additional grants amounting to $385 million through fiscal 1980 ($65 M in 1978, $120 M in 1979, and $200 M in 1980).

The costs of installing the materials will generally be borne out of Comprehensive Employment and Training Act (CETA) funds. Arrangements are now being made with the Department of Labor to facilitate the use of CETA labor for this purpose.

[The House Committee on Banking, Finance, and Urban Affairs has voted to increase the income eligibilty level for this program from 100 percent of the OMB poverty guidelines to 125 percent.] We agree with this change if flexibility is provided to the Administrator of the FEA to ensure that both the tax credit and weatherization are not provided to the same individual.

NEW BUILDINGS

Title III of the Energy Conservation and Production Act of 1976 directs the Secretary of HUD to develop performance standards for new buildings no later than August 1979. These standards are to become effective at the State level no later than February 1981.

President Carter has emphasized the importance of improving the efficiency of energy use in both new and existing housing. He has directed the Secretary of HUD to accelerate by one year the schedule for development and implementation of the new building performance standards.

Section 131 of the National Energy Act proposes to increase the existing authorization of funds to the Secretary of HUD for grants to the States for the purpose of implementing new buildings performance standards.

An additional $10 million in grants to States for each of FY 78 and 79, to be used principally for development of training materials and actual training of those officials responsible for enforcing building codes, should ease the burden on the States of the accelerated schedule.

APPLIANCES

In 1975, by Title III, Part B of the Energy Policy and Conservation Act, Congress made several important judgments:

Consumers lacked adequate information on the estimated operating costs of products;

Significant improvements in the energy efficiency of consumer products were attainable, and;

Consumer education was needed to support the value of life cycle costing and comparison shopping.

Part III of EPCA encourages the design and manufacture of more energy-efficient products by establishing energy efficiency improvement targets for 1980, and by requiring that manufacturers label products with energy cost information.

EPCA also provides authority for the imposition of performance standards. Before prescribing a standard, however, the Administrator of FEA must determine that the standard is technically and economically attainable and that application of the labeling rule alone is not sufficient to induce the manufacture and consumption of energy efficient products. Moreover, the label rule must have been in effect for 18 months before the Administrator may establish the standard.

Existing legislation gives the FEA the primary responsibility for implementing the consumer product energy efficiency test procedures and targets. The Federal Trade Commission (FTC) is responsible for issuing rules requiring that products be labeled and for deciding what information should be disclosed on the labels.

EPCA also requires that FEA develop a program to educate consumers on the use of the labels and on ways of saving energy in the use of consumer products.

President Carter's National Energy Act expands existing authority and contains the following specific elements:

1. Minimum efficiency standards shall be prescribed as soon as possible for refrigerators/refrigerator-freezers, freezers, water heaters, room air-conditioners, kitchen ranges and ovens, central air-conditioners, and furnaces. These products account for about 80 percent of the energy used in American households. Standards for these products would be required because significant improvements in the energy efficiency of each is possible and because a substantial national savings would result.

2. Standards may also be prescribed for dishwashers, clothes washers and dryers, home heating equipment, television sets, and humidifiers and dehumidifiers. Standards may also apply to products as specified by the Administrator under paragraph (14) of Section 322 (A), if the average per household energy use exceeds 150 kilowatt-hours (or btu equivalent) per year and if the aggregate household energy use exceeds 4.2 billion kilowatt-hours per year.

3. Test procedures must be prescribed for a product before a standard for that product can be established. (FEA expects to complete that process by the end of this year.)

4. Standards must be technically attainable and economically justified, and reevaluation of standards is required within five years to determine whether modifications are needed.

5. Manufacturers of consumer products whose gross sales do not exceed $8 million/year may be exempt in whole or part, from standard requirements for up to two years, as determined by the Administrator after prescription of a rule if imposition of the standard may result in substantial lessening of competition.

6. The improvement target system will be eliminated as would the requirement that labels be in place 18 months before specific standards may be prescribed.

In addition to avoiding the delay that results from the requirements of EPCA that a label must be affixed to a product for 18 months before specific standards may be prescribed, the new legislation would make the program simpler and more equitable for manufacturers themselves. Since the current target approach attempts to achieve an overall average efficiency improvement for the industry rather than meet specific standards on a product by product basis, manufacturers have little incentive to attain target levels. In fact, compliance and the higher cost of energy efficient products may place a manufacturer at a competitive disadvantage with respect to other manufacturers who do not attain the same target level. The specific mandatory standards approach of the National Energy Act cuts through the uncertainty. Under the National Energy Act manufacturers whose products are already energy efficient will not be penalized by being forced to improve their products to the same degree as the inefficient products of other manufacturers.

SCHOOLS AND HOSPITALS

Part C of S. 1469 is a major proposal for matching grants to both public and private schools and hospitals. Nonprofit elementary and secondary schools, colleges, universities and hospitals consume about 2.3 quadrillion Btu's of energy per year or the equivalent of about 1,150,000 barrels of oil per day. In

1976, these institutions spent about $4.0 billion on energy; this represents about a 50 percent increase over their energy expenditures in 1973.

There are estimated to be over 200,000 school and hospital buildings in the United States, with a total of about 7.1 billion gross square feet of space. This represents about 25 percent of the total square footage in the commercial buildings sector. Generally, these buildings were constructed so as to minimize their initial cost, without regard to the costs of energy that would be required over the life of the buildings. Consequently, they use energy far less efficiently than is economically justifiable given today's energy prices and the increases that are anticipated. Furthermore, most of these buildings will still be in use 20 or even 30 years from now. Fortunately, a wide variety of actions can be taken to increase the efficiency of energy use in these buildings.

A first step is to survey existing buildings to determine how much energy is used in each and to identify and adopt energy conserving modifications. Conservation measures such as adjusting lighting, ventilation and temperature levels do not require major capital investments and can readily save 15 to 30 percent of the energy used in an average building. Capital improvements, such as added insulation, can then be undertaken. While capital improvements are expensive, they may result in the realization of an additional 15 percent reduction in energy consumption. The resulting dollar savings should more than offset the costs of the initial investment.

Although implementing such a conservation program could save millions of dollars a year, only a small percentage of schools and hospitals have taken effective action. There are three major reasons why conservation measures are not being implemented. First, a general lack of technical expertise has made it particularly difficult for school systems to take effective actions to conserve. Second, it has sometimes been difficult for these institutions to obtain financing for major capital expenditures to improve the thermal efficiency of their buildings. For public schools, large capital investments are often not possible without additional bond referenda, which have normally resulted in substantial time delays and have often been rejected by the communities. Third, schools, hospitals and States have often placed higher priority on objectives other than the establishment of effective conservation programs.

Part C of the proposed National Energy Act would establish a 3-year Federal program of grants to States for energy conserving capital improvements to existing schools and hospitals. Federal grants of $300 million for each of the 3 years, beginning in Fiscal Year 1978, would be authorized to pay for 40 percent of the project costs incurred under the program. Sixty percent of the costs would be borne by the States, local governments, and institutions participating in the program. If the full authorization is appropriated, the required matching funds would amount to $450 million per year. This represents less than 5 percent of the total annual capital outlays of these institutions, and less than 15 percent of the annual expenditures of these institutions on energy. It is our estimate that these initial costs will, on average, be returned to the participating institutions in less than 4 years. Therefore, we believe that the Federal funding proposed by the legislation is a reasonable share of the total costs of making energy conserving capital improvements.

In developing this program, it was the Administration's intention to provide financial assistance to as broad a range of schools as possible based on energy conservation criteria. However, the definition of eligible school facilities does contain language taken from higher education assistance legislation, intented to define those facilities for which such assistance might be constitutionally impermissible apart from energy use efficiency. The House Subcommittee on Energy and Power has amended that unduly restrictive definition, better fitting the language to our intention to reach any parochial school facilities for which such assistance is constitutional. We will thus support a change to this language taking into account the availability and cost of energy used in schools and made in the House which allows assistance to these schools.

Ninety percent of the Federal funding under this program would be allocated to the States according to a formula based on population, climate and other appropriate factors and 10 percent would be allocated by the Administrator after hospitals, as well as other factors. The intent of these provisions of the bill is to ensure that the funds are allocated to those States where energy use is the highest and to provide some discretion to the Administrator to provide additional funds to areas where energy costs are particularly high and the prospect of shortage great. Under the legislation, States would be required to establish

procedures to ensure that equitable consideration is given to all eligible public or non-profit schools regardless of type of ownership.

If this legislation is promptly enacted and fully funded, we estimate that approximately 35 percent of all eligible school and hospital buildings would receive financial assistance for energy conserving capital improvements (including solar energy) under this program, saving from 0.2 to 0.25 quadrillion BTU's per year by 1985 or the equivalent of 100,000 to 125,000 barrels of oil per day.

VANPOOLING

Vanpooling is an excellent example of how to achieve significant energy savings by substituting a simple, sensible measure to provide commuters with reliable, convenient home-to-work transportation.

Private industry and State governments have led the effort to advance the vanpooling concept. The 3M company of Minneapolis introduced vanpooling in 1973. In New Jersey 17 firms currently sponsor vanpool programs, more than any other State; the Prudential Insurance Company alone has 70 vans on the road each day. Commuter Computer, a ridesharing corporation sponsored jointly by the California Department of Transporation and the private sector, initiated a 10 van program in March of 1976 in Los Angeles. Today they have over 90 vanpools on the road and have 125 more vans on order to be phased in by the end of the year. The number of vanpool sites has doubled in each of the last 4 years, and now includes over 100 sites nationwide. The State and corporate programs now have over 1,500 vans serving over 15,000 commuters. This represents an impressive beginning, and has resulted in eight State legislatures passing laws removing regulatory impediments to vanpools.

The energy conservation potential of vanpooling is significant. Each 12 passenger vanpool is estimated to save over 5,000 gallons of gasoline per year. If we could stimulate vanpooling and carpooling to achieve an overall average auto occupancy of only two persons per car, the Nation would realize energy savings of 400,000 barrels of oil per day or 17 million gallons of gasoline per day.

Vanpooling programs to date have characteristically begun with a company obtaining one or more 12–15 seat vans and assigning them to groups of employees for their daily commute. One member of the group drives and manages the operational aspects including keeping the van clean, fueled and maintained. This reliance on the vanpool driver/coordinator has reduced administrative and other costs which would otherwise have fallen upon the company to underwrite.

In exchange for his services, the driver/coordinator gets a free ride to-and-from work and the added option of using the van on weekends for a small fee. The other participants share in the payment of low equal monthly fares which cover all acquisition and operating expenses.

The financial arrangements of vanpooling, which varied, have some basic characteristics. Private and State initiated vanpooling programs now in operation have arranged initial van acquisition generally through direct purchase or leasing arrangements. Fares have been determined by dividing the total leasing or purchasing costs and all insurance, maintenance and gasoline costs by the number of paying participants. These fares are collected periodically either by payroll deduction or by the vanpool driver.

Commuter fares have shown, in general, significant savings for vanpool participants. Long distance commuters have the most to gain. For example, in the very successful 3M Company vanpool program in Minneapolis a single-occupant commuter in that city with a 60 mile round trip spends an average of $137 per month on total auto commuting costs including gasoline, oil, maintenance, repairs, and tire replacement. This compares to a typical vanpool fare of $40 per month in the 3M program. As one 3M vanpooler stated, "My personal car gets driven much less. My wife now has a car at home all the time. I feel I've purchased a second car plus chauffeur both for only $22 a month."

While the Federal Government has strongly supported and encouraged efforts to develop and promote vanpooling, it has not, unfortunately, been able to sponsor vanpool programs for its own employees because the Federal Government is forbidden by law to use Federally owned vehicles to transport employees to and from work.

The adoption of the vanpool provisions in the proposed National Energy Act would allow the Federal Government to buy passenger vans to be used to transport employees to and from work in a self sustaining vanpool system.

Our proposal would amend Section 381 of the Energy Policy and Conservation Act to authorize the Administrator of the FEA to provide for the establishment of vanpool programs for Federal employees and provide that the Administrator of the General Services Administration (GSA) may acquire vans by purchase, lease or other arrangement, and establish and operate training programs for operators of such vans. The legislation would authorize acquisition of up to 6,000 vans for use in Federal vanpooling arrangements.

All participants would pay a rider charge to include the cost of Government self-insurance against liability. This charge will fully reimburse the Federal Government for all program-related expenditures.

The private sector has had the foresight and interest to take the first steps to implement vanpooling throughout the Nation. With passage and funding of this legislation, the Federal Government will follow suit and practice what we preach, with ultimate savings of over 535,000 barrels of oil per year by 1981.

FEDERAL SOLAR EQUIPMENT

The solar energy provisions of the National Energy Act will encourage the more rapid commercialization of solar heating and cooling technologies.

FEA's analysis of the potential effects of a program to install solar water and space heating equipment in Federal buildings indicates that such a program could substantially accelerate production and installation rates for these systems. Accordingly, Part G of S. 1469 proposes a 3-year program with funding of up to $100 million for the installation of solar energy systems in Federal buildings. Separate proposals in other sections of the bill include tax credits to encourage consumers and industry to install solar energy systems, and solar heating and cooling is eligible for funding under the schools and hospitals program I previously described. The combined effect of the Federal initiatives is expected to be a substantial acceleration in the rate of producing and installing solar equipment.

These new initiatives would be in addition to ongoing solar demonstration programs for the private sector funded through the Energy Research and Development Administration with total cumulative funding to $260 million through FY 1979 to provide for 4,000 solar heating and cooling demonstration units and to install 10,000 solar water heaters.

Part G of S. 1469 would fund the installation of solar equipment in approximately 3,000 Federal buildings. Projects totaling $60 million have already been tentatively identified by GSA, DOD, and others. Through this effort the Federal Government would gain experience with the maintenance and operation of solar equipment; we would then be able to use this experience in assisting other solar energy users. We view this particular aspect as an important contribution to increasing consumer confidence in solar heating and cooling.

Further, substantial purchases by the Federal Government over the next few years can help lower the costs of production and installation of solar heating and cooling equipment as experience is gained and economies of scale are attained. In terms of a rough estimate, expenditures for this program in the first year could amount to about 20 percent of the projected market for solar equipment in that year.

Ultimately, this program will be implemented by at least 15 Federal agencies, including the Department of Defense, the General Services Administration, the Veterans Administration, and others. However, FEA or a successor Department of Energy would have the responsibility to coordinate and evaluate agency proposals to install solar equipment on Federal buildings. FEA is working in close cooperation with other Federal agencies in establishing guidelines and planning the implementation of this program, and I might add that these agencies are showing a great deal of enthusiasm and readiness to proceed with this program.

CONCLUSION

Most of the conveniences we are accustomed to in America involve the use of energy. Our society has developed habits which depend upon the availability of cheap and plentiful fuels. Our buildings, our transportation system, even many of our recreation activities reflect that abundance. Though plentiful energy of many types can be identified in nature, we find it is no longer cheap to acquire fuels and use them acceptably. America will be different in the future because of this change—not worse, but different.

The transition may happen abruptly, or it may happen more gradually. The 1973–74 oil embargo gave us an unexpected glimpse of how an unplanned change in fuel supplies disrupts our lives, as did the past severe winter show the effects of increased demand. The proposals I have outlined today, along with others you will eventually vote on, will allow us to make our transition gradually. Without them it will be too easy to put off difficult choices until it is much harder to make them, and we will continue to become increasingly vulnerable to disruption of supplies or pressures to spoil our natural environment. None of our proposals alone provides the answer. But without their cumulative effect, our ability to choose our future as a Nation is weakened.

IMPACTS OF MANDATORY STANDARDS FOR APPLIANCE EFFICIENCY

EPCA establishes appliance efficiency targets for 10 appliances which must be at least 20 percent more efficient than their aggregate energy efficiency in 1972. This requirement formed the basis for estimating the base case energy savings of the President's proposed appliance program. The following table presents the appliance energy efficiency improvements expected in 1985 for 8 of the major appliances without the proposed program, and the expected improvements expected if the President's appliance initiative is enacted.

ESTIMATED IMPROVEMENTS IN AVERAGE APPLIANCE EFFICIENCY OVER 1972 LEVELS (PERCENT)

	Expected improvements from EPCA appliance program	Expected improvements from President's initiative
Refrigerators	27	47.
Freezers	17	30.
Clothes dryers	5 electric, 10 gas	8 electric, 18 gas.
Water heaters	10 electric, 14 gas, 13 oil.	18 electric, 25 gas, 23 oil.
Room air-conditioners	15	54.
Clothes washers	15	20.
Furnaces	5	23.

Note: Cumulative energy savings estimate (1985): 220,000 barrels of oil (equivalent) per day.

GAS COMPANIES MARKETING ATTIC INSULATION—1977

NEW ENGLAND

Bay State Gas Company	Springfield, Massachusetts
The Berkshire Gas Company	Pittsfield, Massachusetts
Cape Cod Gas Company	Hyannis, Massachusetts
Gas Service, Inc.	Nashua, New Hampshire
Fall River Gas Company	Fall River, Massachusetts
Valley Gas Company	Cumberland, Rhode Island

MIDDLE ATLANTIC

The Brooklyn Union Gas Company	Brooklyn, New York
Corning Natural Gas Corporation	Corning, New York
Elizabethtown Gas Company	Elizabeth, New Jersey
Equitable Gas Company	Pittsburgh, Pennsylvania
National Fuel Gas Dist. Corp.	Buffalo, New York
Philadelphia Electric Company	Philadelphia, Pennsylvania
UGI Corporation	Valley Forge, Pennsylvania

EAST NORTH CENTRAL

Consumer's Power Company	Jackson, Michigan
Michigan Consolidated Gas Company	Detroit, Michigan
Michigan Gas Utilities Company	Monroe, Michigan
Northern Illinois Gas Company	Aurora, Illinois

WEST NORTH CENTRAL

Minnesota Gas Company	Minneapolis, Minnesota
Peoples Natural Gas, Division of Northern Natural Gas Company	Omaha, Nebraska

SOUTH ATLANTIC

Central Florida Gas Corporation	Winter Haven, Florida
Commonwealth Gas Distribution Co.	Petersburg, Virginia
North Carolina Natural Gas Corp.	Fayetteville, North Carolina
Washington Gas Light Company	Washington, D.C.

EAST SOUTH CENTRAL

United Cities Gas Company	Nashville, Tennessee

MOUNTAIN

Cheyenne Light, Fuel & Power Co.	Cheyenne, Wyoming
Cut Bank Gas Company	Cut Bank, Montana
Great Falls Gas Company	Great Falls, Montana
Mountain Fuel Supply Company	Salt Lake City, Utah
Public Service Company of Colorado	Denver, Colorado

PACIFIC

Alaska Gas and Service Company	Anchorage, Alaska
Northwest Natural Gas Company	Portland, Oregon
San Diego Gas & Electric Company	San Diego, California
Southern California Gas Company	Los, Angeles, California
Washington Natural Gas Company	Seattle, Washington

Senator JOHNSTON. I regret to tell the rest of the panel we have run 32 minutes overtime so we will have to restrict your statements to 5 minutes.

Dr. Mannella.

STATEMENT OF DR. GENE G. MANNELLA, ACTING ASSISTANT ADMINISTRATOR FOR CONSERVATION, ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION; ACCOMPANIED BY DR. MAXINE SAVITZ, DIRECTOR, DIVISION OF BUILDINGS AND COMMUNITY SYSTEMS

Dr. MANNELLA. With your approval, Mr. Chairman, I will insert my full statement in the record, and just highlight for you here today some of the activities of the Energy Research and Development Administration—ERDA—that relate to the provisions of the energy act that have been under discussion here.

We have, for example, conducted a significant study of the insulation characteristics of materials that are presently on the market and we are engaged in the classification and evaluation of current application techniques.

We are involved in the development of improved and/or new wall cavity, exterior, and interior insulation techniques including those suitable for retrofitting of existing residences. We are investigating the adequacy of the testing procedures for fibrous insulating materials and we have an extensive study of the properties of commercially available cellulosic thermal insulation materials. Both of these relate to the residential portion of the law.

With regard to the provisions that relate to educational facilities and hospitals, ERDA has formed an ad hoc committee, which includes representatives of the Department of Health, Education, and Welfare, the Department of Commerce, the Federal Energy Administration and various national education associations. This ad hoc committee has investigated the opportunities for energy conservation, in institutional buildings such as schools and hospitals and has set forth a number of findings. Typically they were found to lack the staff expertise to do a thorough energy audit.

Further, it was determined that laboratiories, medical facilities, and gymnasiums are generally the most energy intensive of all campus buildings because of code requirements for large volumes of fresh air ventilation in those buildings. We have other activities ongoing in this area that could be of some assistance, including a site specific computer program which incorporates performance and economic analysis which could be used by an institution to analyze the energy consumption in particular type buildings and determine the opportunities for energy conservation.

With regard to Federal buildings, we do have an extensive number of programs jointly with other agencies that relate to the use of solar technology. We have a substantial number of programs ongoing with NASA, approximately nine projects I believe.

ERDA itself manages a very large number of buildings throughout the United States. We are implementing about a dozen solar energy demonstrations in the ERDA facilities.

This is a brief rundown, Mr. Chairman, of the kinds of research and development ERDA is doing that relate to the provisions of the bill under discussion this morning. Here with me this morning is my colleague, Dr. Maxine Savitz, Director of the Division of Buildings and Community Systems, who will help us answer any questions.

Senator JOHNSTON. Thank you, Dr. Manella. How close are you getting to standards for all of this material, this insulation, storm windows, all of that?

Dr. MANNELLA. We have just completed the survey and testing of the materials on the market now that are cellulose based. What we have found is a very wide discrepancy between some of the advertised values and some of the actual values in thermal activity which would be one of the most important characteristics.

We think this is simply a matter of the lack of good quality control and testing procedures and we are working with the American Society for Testing Material which sets the standards throughout all industries for the test procedures to see if we can tighten these up.

Senator JOHNSTON. What are you going to do when you get these standards?

Dr. MANNELLA. We would ask the ASTM to incorporate them in the test techniques that industry uses to test its materials and hopefully thereby getting a common level of testing, or testing technique, throughout the entire industry.

Senator JOHNSTON. Once they adopt the common testing technique, what do they do with that? Is there a standard that anybody uses in purchasing, or is required to use in purchasing?

Dr. MANNELLA. Not in purchasing. These are the techniques by which an industry typically runs its quality control of its product.

They take samples of a product and test them. The key is usually to have a fixed or acceptable testing technique so everybody is testing to the same technique. Then anybody who want to purchase a large amount of their material, wants to check a sample to see if that does meet certain characteristics, uses the same technique.

The intent here would be to standarize the testing technique and hopefully thus include the quality control of the goods that are on the market.

Senator METZENBAUM. Something might happen, now or 10 years ago, to make it mandatory——

Dr. MANNELLA. Their time frame is rather long.

Senator METZENBAUM. Can you give me a good reason why it should not be made mandatory if we can achieve energy savings?

Dr. MANNELLA. The best reason I can give you, we don't have the procedures developed.

Senator METZENBAUM. When would you have it done?

Dr. SAVITZ. By the fall of this year we will have enough interim data.

Senator METZENBAUM. The fall of this year?

Dr. MANNELLA. One of the first things we could do would be to ask ASTM whether or not they would include it as an interim standard.

Senator METZENBAUM. That ought to help 10 or 20 years from now.

Dr. MANNELLA. We hope to have it effective much sooner than that.

Senator METZENBAUM. What is your assessment of Dr. Wanlass' electric motor if his claims are true? How important will his efforts be in our conservation of energy?

Dr. MANNELLA. Dr. Wanlass' invention has been reviewed by some of the ERDA staff several months ago and was found to have considerable potential for small horsepower motors. It has been tested by the McDonald Corp., which is a very good outfit to do that sort of thing since fast-food facilities are very energy intensive, as well as by a utility, Southern California Edison. Thus far it looks like it is very effective in saving energy on small horsepower motors that have varying loads.

It has yet to be demonstrated on large-horsepower motors. It is not quite, but I believe shortly, will be an article of commerce. I think the items that have been tested by McDonald and the utility were some prototypes Dr. Wanlass had put together prior to going into production.

Senator METZENBAUM. I would urge you to expedite the evaluation of this concept that has received so much publicity and interest.

Dr. MANNELLA. Interestingly enough——

Senator JOHNSTON. I hate to do this, but we are just running out of time. Senator Weicker?

Senator WEICKER. No questions.

Senator DOMENICI. No questions.

[The prepared statement of Dr. Mannella follows:]

STATEMENT OF DR. GENE G. MANNELLA, ACTING ASSISTANT ADMINISTRATOR FOR CONSERVATION, ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

Mr. Chairman and members of the subcommittee, thank you for this opportunity to present the views of the Energy Research and Development Administration on Title I, Parts A, B, C, and G of the President's proposed energy legislation relating to Energy Conservation Programs for Residential Buildings, Energy Efficiency of Consumer Products, Energy Conservation Program for Schools and Hospitals and Federal Energy Initiatives.

The diagnosis of the U.S. energy problem is very simple: Demand for energy is increasing, while the available domestic supplies of oil and natural gas have been declining. The cure, however, is far from simple, and its solution requires attention to complex economic, political and social factors, as well as technical factors.

The President's proposed National Energy Plan does address the energy problem comprehensively. By doing so, it is able to propose measures that would reduce imports to a manageable level, instead of incurring the full costs of eliminating them. This approach would also bring about effective conservation without changing the basic standard of living or interfering with continued economic growth.

The strategy of the Plan is to achieve sensible, cost-effective conservation in all sectors of energy use: in residences and other buildings, in transportation, factory equipment, and appliances.

The Nation's current stock of buildings, automobiles, equipment and other capital goods currently uses energy inefficiently. The conservation measures proposed would modify that capital stock in an orderly way, so that by the mid-1980's we will be able to use energy far more efficiently than we do today.

I would now like to discuss the parts of the National Energy Plan being considered today.

Currently, there are approximately 74 million residential units in the United States. Almost 20% of U.S. energy is used for the heating and cooling of buildings. Virtually all of these buildings were built in a time when energy was plentiful and cheap, and few have been fully modified to conserve today's expensive fuels. Major savings to the Nation are possible from each of the following measures: Ceiling insulation; storm windows and doors; automatic thermostat controls; caulking and weatherstripping; modification of existing furnaces; and insulation of walls, floors, heating ducts and water heaters.

Significant savings can be made by improving single family buildings with the above measures. We cannot achieve these savings, however, unless people continue or increase their current energy conservation practices.

The proposals for residential energy conservation are designed to encourage home conservation investments through economic incentives as well as to provide information and financing to those homeowners needing that assistance. They are based on an expectation that American homeowners will respond to these programs without the need for costly and cumbersome mandatory requirements for homeowner action.

We estimate that the expected additional savings from the Federal Incentive Programs in this area can be approximately 500,000 barrels of oil per day equivalent.

ERDA has been working in a number of areas which impacts this programmatic area.

Because the insulation industry is composed of many competing segments, e.g., fiberglass, mineral wool, cellulose materials, and foams, the ERDA program addresses multiple approaches most appropriate to each segment to achieve large national energy savings. The real potential of available and prospective insulation refit actions for reducing energy losses cost effectively is assessed, and a close working relation has been established with industry to assist in development of programs consistent with national energy conservation goals.

Our ongoing programs include:

Classification of Insulating Materials.—Identify and classify, according to thermal characteristics, toxicity, flame travel, and code requirements, all insulation materials now on the market; determine, to the extent possible, thermal and other characteristics of insulation materials under actual installed conditions; identify and evaluate current application techniques and rank potential innovations in such techniques according to their effectiveness.

Improved and/or New Wall Cavity, Exterior, and Interior Insulation Techniques.—Develop improved or new techniques for installing the various types of existing insulation materials so as to increase their thermal effectiveness.

Investigating the Adequacy of the Testing Procedures for Fibrous Insulating Materials.—This is in support of development of insulating testing procedures.

Developing Public Data on the Quality of Commercial Fibrous Insulation Data with Respect to Thermal Performance.

Studying the Properties of Commercially Available Cellulosic Thermal Insulation Materials to Obtain Base Level Data on the Materials.—ERDA's study indicated that the quality of cellulose insulation is very variable with both good and bad qualities, e.g., the materials exhibited a wide range of corrosiveness against aluminum, copper and steel when tested in accordance with standard specifications. The results of the survey show the need for a better understanding

of the parameters which control the performance of cellulosic insulation and the need for improved standard specifications.

The major thrust of the ERDA program in the area of space conditioning is the refitting of existing buildings with space conditioning improvements, devices, and systems that will markedly improve the energy efficiency with which heating and cooling service is provided. Substitution in existing and new buildings of HVAC systems which make optimal use of abundant domestic resources is being pursued.

Ongoing projects include:

Space conditioning technical assessment to develop and rank opportunities for equipment refit for existing and new oil-fired residential and commercial systems which are cost-effective and require a minimum use of energy.

Testing existing and new oil-fired equipment for residential and light commercial use to determine ways of improving efficiency.

We also believe that energy efficiency standards for consumer products can lead to major energy savings. ERDA's consumer products program is directed toward more efficient components, materials, and devices that would be applicable to making appliances more efficient than those currently on the market.

The President has also proposed a three-year program of matching grants to States for energy conserving capital improvements to schools and hospitals. Federal grants of $300,000,000 for each year, beginning in FY 1978, would be authorized. Funds would be allocated among the States based upon population and climate.

There are over 200,000 schools and hospital buildings in the United States, with a total of about 8 billion square feet of space. In 1975, these buildings used about 2.3 quadrillion BTU of energy or the equivalent of 1.15 million barrels of oil per day.

It is estimated that energy use in at least half of all school and hospital buildings can be reduced, on an average, by 30 percent through a combination of energy conserving measures. Such a reduction would not only contribute to the achievement of our national energy goals, but would also result in lasting cost savings to these institutions.

In Fiscal Year 1977, the Division of Buildings and Community Systems in ERDA began a research, development and demonstration program for energy conservation in educational facilities and hospitals. In order to identify and answer the needs of schools and universities, an ad hoc Joint Committee of Energy Conservation in Education Facilities (JCECEF) was formed at ERDA's initiative. Members of this Committee include ERDA, the Department of Health, Education and Welfare (Office of Education), the Department of Commerce, the Federal Energy Administration (FEA), various national education associations, and architectural and engineering technical societies.

Some of the initial observations of the JCECEF are:

(1) Schools typically have a lack of "on-staff" technical expertise regarding the selection of appropriate retrofits of existing school buildings. As a result, energy conservation actions are scattered and indecisive. School administrators have an urgent need for fundamental data and for inexpensive selection techniques to assist them in deciding upon optimal conservation measures which will save maximum energy at minimum cost.

(2) Laboratories, medical facilities, and gymnasiums are generally the most energy intensive of all campus buildings because of code requirements for large volumes of fresh air ventilation in those buildings.

(3) Various, and often conflicting, currently administered codes and standards have confused and inhibited the practice of energy conservation in educational facilities. A preliminary study performed for ERDA confirmed the presence of a large array of conflicting codes, standards, rules and regulations imposed by public agencies and private groups which cause excessive energy consumption.

(4) There is a distinct separation of many needs and requirements between schools and universities, in terms of level of technical expertise with retrofits particularly in priorities, performance and costs.

In order to begin to address these problems, the FEA, through contracts with the American Association of School Administrators (AASA) and the Educational Facilities Laboratories (EFL), selected 10 schools in the U.S. to be retrofitted to conserve energy and reduce fuel costs. The object was to: (1) determine the potential impact of conservation measures in this type of building and (2) determine if an inexpensive computer program could be utilized and verified to determine whether a school building was consuming more energy than its design

anticipated. The computer program developed for FEA provides a calculated annual energy usage which can be compared to actual energy usage. If actual energy usage appears excessive, it is assumed that operations and maintenance levels are inadequate for the facility. The computer, therefore, provides a valuable tool for the school administrator to initiate a low-cost conservation program by improving the operations and maintenance of his or her facility. At the present time, the computer program is not capable of providing a detailed energy analysis for selection of specific retrofits which may require an investment.

In furtherance of this work, ERDA is currently developing a comprehensive computer program which is very site-specific and incorporates performance and economic analysis. For each of the 10 selected schools in the FEA project, architechtural and engineering firms identified specific retrofit measures. However, FEA involvement in this project will end before any actual retrofit. Though funding arrangements and time schedules have not been finalized, we plan to support the installation, instrumentation and monitoring of the schools in the pilot retrofit program.

In the pilot program, monitoring prior to retrofit is desirable in order to obtain an evaluation of the effectiveness of each modification. In this manner, it is anticipated that we will be able to develop actual field data as a quantitative resource which school administrators can use in selecting their own retrofits and convincing the taxpayers of the need to raise the capital through local bonding procedures.

It is also planned to use these buildings as test facilities for new technologies.

Finally, some comments on President Carter's proposals for initiatives in Federal buildings. The Federal Government's building inventory includes some 403,000 buildings in 11 categories, including residences, offices, hospitals, schools, prisons, and research and development installations. These buildings contain about 2.5 billion square feet of floor space; energy use averages more than 300,000 BTU per gross square foot per year. GSA estimates that at the current replacement rate, approximately 85% of the present building stock will be in use in the year 2000. The Government also constructs approximately 20,000,000 square feet of floor space annually.

ERDA's present solar demonstration program involves all Federal Agencies with buildings that can utilize solar energy applications for hot water, space heating and cooling. The program has already encompassed a wide variety of building types, climatic regions, and solar energy systems, and addresses specific procedures pertaining to design, procurement, installation, and evaluation. It is considered a subset of all building programs having potential solar energy applications.

Data from the demonstrations provide information on the areas of activity most amenable to market stimulation. Current emphasis is on solar water and space heating applications, because development is more advanced and system costs are lower than for combined solar heating and cooling or solar cooling systems, although a number of demonstrations including cooling have also occurred.

Large-scale solar heating and cooling demonstration projects are also being carried out in cooperation with GSA on new and existing buildings of various types throughout the United States. GSA provides a potential market of some 3,000 Federally-owned buildings and 7,000 leased buildings. Efforts are focused on large, new construction, energy-use optimization techniques, cost-effective retrofit designs, and energy conservation measures.

Large solar energy systems, which are installed in new Federal buildings in Saginaw, Michigan, and Manchester, New Hampshire, will provide a substantial portion of the energy required for the heating, cooling, and hot water needs of these buildings. The design phase of solar energy system has been implemented for the new Federal youth correctional facility in Bastrop, Texas, and a solar retrofit for an existing Federal building in Denver, Colorado, is under consideration.

NASA is a major participant in the program because of its research and technology development capabilities. NASA has completed a solar energy system installation in the systems engineering buildings at its Langley Research Center. This system is being used for detailed studies of the application of solar energy to buildings. As part of the FY 1977 demonstration program, new systems concepts and approaches for solar applications in NASA facilities are being examined. Nine solar demonstration projects are under design in a joint NASA/ERDA program that has been implemented in FY 1977.

ERDA itself manages a large number of buildings in the United States and we are implementing 11 solar energy demonstration projects in ERDA facilities. The Title II or final design has begun on most of these 11 projects. These projects will emphasize hot water and space heating applications. They will relate to the development and verification of system sizing procedures and life-cycle costing models developed by ERDA and the procedures and techniques for assessing and implementing solar applications for other Federal agencies and in the private sector.

We believe that the President's program to provide funds to install solar hot water and space heating equipment in Federal buildings can have a major impact in accelerating the commercialization of these systems. Allocating up to $100 million over the next 3 years, as the President proposes, will also indicate commitment and leadership of the Federal Government in the commercialization of solar equipment. These purchases, if innovative procurement are followed, should assist in the reduction of unit prices of solar equipment through the experience gained in production and the economies of scale.

In summary, we believe that the President's proposed National Energy Plan does address the energy problem comprehensively. Taken as a whole, it distributes benefits and burdens equitably among various sectors and income groups in this country. We urge your favorable consideration of the package.

Mr. Chairman, I would be happy to answer any questions of the Subcommittee.

Senator JOHNSTON. Dr. Shalala.

STATEMENT OF DR. DONNA SHALALA, ASSISTANT SECRETARY FOR POLICY DEVELOPMENT AND RESEARCH, DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Dr. SHALALA. We have testimony that describes HUD activities in the energy conservation field. Specifically the responsibilities we will take for helping on the energy conservation and performance standards for residential and commercial buildings, and the promulgation of those standards. This is all contained in our testimony.

I would rather take 2 minutes and tell you what we are doing today to change the impression the administration is waiting simply for the legislation. Yesterday HUD opened the first of 10 city 2-day seminars for builders, for architects, and for engineers, telling them everything we know about conserving energy for new buildings in this country.

HUD has open, I guess for a couple of months, an energy efficient residence out in Mt. Airy, Md., which thousands of people have walked through. What we did in that case was not take some fancy new design that no one would want to live in, but try to demonstrate in a pretty ordinary middle-class suburban development; there are some things a builder can do now with materials that are available that would reduce the amount of energy consumption between one-third and one-half without major new costs, without dramatic new costs.

There have been builders, developers, and architects that have gone through that home and we are transferring that information to builders-developers around the country.

Our seminars are going to be widely attended around the country. The first, as I indicated, opened yesterday. In addition to that we have a best seller, at least thousands of copies of our publications, "In The Bank Or Up The Chimney," have been distributed around this country. It is a publication in which any homeowner can sit down and read now and find out a set of things that they can do in their own home, either themselves or with a subcontractor.

I would indicate there are things people can do now in existing homes. Our new construction activities also have a set of technology

now. I would not describe it as breakthroughs, but a set of new steps people can take in existing homes that will cut down energy, so I think I will end my statement by simply saying what Housing and Urban Development is doing now in the energy crisis.

Senator JOHNSTON. I am personally very concerned about this question of contractors who come out and do your insulation, et cetera. I have seen so many poor people who were ripped off on aluminum siding. They come around and say we will do an estimate on your house. The people sign a note, the work is not done properly, the note is negotiated with somebody else. It is a tremendous ripoff.

The average person does not know whether his house is properly insulated or not. To tell you as chairman of this subcommittee, I don't know if my house is properly insulated or not. I, and I am sure a lot of other people like me, would like to be able to call up somebody, be it a utility or what and say come out and do the insulation, and be able to certify that house.

Then, when they find out what they need, then know there is a Government-certified contractor who will properly do the work according to Government standards and according to a Government price list. I am not at all persuaded by what Mr. Bardin said, that you can trust your Better Business Bureau, or whatever it is, to do this work.

There is too much pressure on it. You are telling the people they have to have their list of contractors; they can charge it on their bill, not only can, they must, charge it on their bill. I guess that means a cutoff in service if they don't pay.

I just think somebody needs to set these standards and the cost controls just in the way you have on an FHA house. Would HUD be the proper one to do that? What is your response?

Dr. SHALALA. We are going to be writing standards. We have already done them in the past, as you know, for FHA homes, but I am not sure we are going to do the kind of standards you are talking about.

Let me refer the question to Joe Sherman who is director of our building division.

Mr. SHERMAN. I think the President's plan of utility companies is to have that independent third part of the utility company come out and make an inspection of that house, not trying to sell you insulation, but do an independent inspection of what it is you do need and then be able, if you ask for it and want it, to recommend half a dozen or so different contractors in a given area that can do the work.

It is not the contractor trying to make the buck, trying to sell you more insulation than you may need. It is theoretically the third party utility company. In this booklet we put out—it is a very simply done form of cartoons—this is a flyer for the booklet that actually takes you through to find out what your cost is; how much insulation you do need.

You can call your local hardware store and find out what insulation is costing today. You can look around your attic and it shows you what to look for. Fill in these little blanks.

Senator JOHNSTON. Some of us are not very handy around the house.

Mr. SHERMAN. This was tested before we sent it out on the market, on some of our wives and some of the women's husbands in the office, to see if they could do it. Lo and behold, most of them were able to do

it in their own homes. It is not a very sophisticated thing, it is really very simple when you sit down and try to do it if you are not afraid of it.

Senator METZENBAUM. I was interested in your testimony and what you are actually doing in the field. I have no questions.

Senator DOMENICI. Mr. Chairman, I stepped out for a moment. I don't know if Dr. Shalala answered the question about institutional financing across the board. Has there been an analysis of the various finance arrangements the Government has now to see how many of them could be fit into the financing of insulation and improvements that are energy conservation oriented?

Dr. SHALALA. We are ready now under title I, there would be funds available. Title I of the Housing Act, that funds would be available. It is my understanding when the bill was put together there was a review of existing HUD programs to know what programs would be available.

Mr. HEMPHILL. In fact our proposal would make utilities, would allow utilities, to become title I lenders, thus expanding title I programs substantially and would set up a market for those title I loans, so you could turn over rather small short-term notes.

There was some, perhaps not adequate, a fair amount was given to those issues.

Senator DOMENICI. Could I ask one question about a specific weatherization-type program. Dr. Shalala, has there been any effort at HUD to take a look at combining the weatherization program with grant programs designed for just the modernization of poor homes?

We have had an ongoing program in which the Federal Government helped fix up homes in ways such as putting in running water. I wonder if we are trying to combine the two efforts so we don't go through a poor area or a rural area twice?

Dr. SHALALA. Section 312 of the Community Development provides some funds for housing rehab, low-interest loans, that area. There is also another subcommittee, we will be glad to provide a detailed answer to that question listing the programs we have that fit with some of the requirements under the weatherization program.

Senator DOMENICI. I would be specifically interested in whether rehab includes weatherization, or whether weatherization can be merged with rehab.[1]

Dr. SHALALA. It is both.

Senator DOMENICI. Would you give us both?

Dr. SHALALA. Yes.

[The prepared statement of Dr. Shalala follows:]

STATEMENT OF DR. DONNA SHALALA, ASSISTANT SECRETARY FOR POLICY DEVELOPMENT AND RESEARCH, DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Mr. Chairman and members of the committee, I am pleased to appear before you today to present the views of the Department of Housing and Urban Development on the "National Energy Act."

The President's National Energy Plan calls for the insulation of 90 percent of all American homes by 1985, and the establishment of energy efficiency requirements for all new buildings by 1980. Residential energy consumption amounts to approximately 23 percent of national energy use, or the equivalent of 8.3 million barrels of oil per day at today's levels of consumption. Three-

[1] The answer appears in appendix I.

quarters of total residential use occurs in single-family dwellings, with the remainder in multifamily buildings. Space heating and cooling and the heating of domestic hot water are the predominant end uses of this energy. We believe that improving the energy efficiency of existing residences alone could save more than 500,000 barrels of oil equivalent per day, and that these savings can and should be realized through prudent investment in energy conservation measures. The President has proposed both subsidies and financing programs to encourage this investment. My colleagues from the Federal Energy Administration have described these proposals at some length, so I will not dwell upon them further. Those parts of the President's program which relate specifically to HUD activities are contained in Subpart 2 of Part A of the proposed National Energy Act, which we understand to be outside the scope of today's hearing.

Section 102 of the Bill requires the Administrator, in consultation with the Secretary of Housing and Urban Development and heads of other agencies, to promulgate rules for the content and implementation of residential energy conservation plans for utilities within 120 days of enactment. Those rules:

"(1) Shall identify the suggested measures for residential buildings, by climatic region and by categories determined by the Administrator on the basis of type of construction or any other factors which the Administrator may deem appropirate; and

(2) May include—

(A) Standards for general safety and effectiveness of any suggested measure;

(B) Standards for installation of any residential energy conservation measure; and

(C) Such other requirements as the Administrator may determine to be necessary to carry out this subpart."

The Department supports this provision, which we believe will assist to insure that residential energy conservation plans are effectively developed and implemented.

Under Title III of the Energy Conservation and Production Act (PL 94–385), the HUD Secretary is directed to develop and promulgate energy conservation performance standards for all new residential and commercial buildings. These standards are then to be adopted by State and local governments for implementation in building codes and other mechanisms for regulation of construction. The first phases of this effort involve development of a buildings classification system in which regions of the country will be defined, and existing construction practices for various types of buildings will be documented. These tasks are part of a newly initiated contract effort with the American Institute of Architects Research Coropration and related professional organizations. We believe the output of this activity in the Title III standards program will be of considerable assistance in formulating residential energy conservation plans.

For the record, I would like to point out that the Department of Energy Organization Act would transfer the authority for promulgation of these standards to the new Department. Although some differences exist between the House and Senate versions, HUD will assist in the development of these standards, and incorporate them into the HUD Minimum Property Standards when they become effective.

Section 131 of the National Energy Act increases the authorization for the HUD Secretary to make grants to States and units of general purpose local government to assist them in meeting the costs of adopting and implementing energy conservation performance standards for buildings. Ten million dollars per year will be provided for this purpose for Fiscal Years 1977 and 1978, in addition to the $5 million presently authorized for Fiscal Year 1977. These funds will provide for:

Implementation planning at the State and local level;

Demonstration of administrative approaches that will allow for effective adoption of the performance standards when they become available;

Education and training of State energy and buildings officials, to assure rapid adoption and implementation of the new performance standards.

The adoption of new standards and codes for building construction can be a protracted and controversial process. These funds will help to accelerate that process for the energy performance standards.

Several of the Department's existing programs also provide resources in the form of technical experience in this area.

For years, HUD has maintained Minimum Property Standards (MPS) for construction that is insured or built under HUD programs. Sections of these

standards relate to energy consumption, and for several years, HUD has been working to upgrade and tighten the sections of the MPS dealing with the energy efficiency of buildings. Since the MPS have served as an important benchmark for the construction industry, the years of experience gained in finding reasonable levels of performance will translate directly into an understanding of what can be accomplished through energy conservation standards.

Secondly, Title VI of the 1974 Housing and Community Development Act charged HUD with responsibility for development and enforcement of National Mobile Home Construction and Safety Standards. All mobile homes constructed in this country must meet the provisions of the standards. HUD must also insure that enforcement programs underway in the States are effective.

Finally, in the solar heating and cooling demonstration program, HUD has been charged to develop standards for residential solar heating and cooling systems and systems installation. The Department published "Interim Performance Criteria" for residential solar heating and cooling systems in January 1975, less than 90 days after the legislation calling for them was enacted. However, we have now gone far beyond the interim criteria, in the "Intermediate Minimum Property Standards for Solar Heating and Domestic Hot Water Systems." This new portion of the MPS has been through extensive development and full review and comment by the growing solar industry and interested parties, and is now undergoing final Department review. HUD is also actively supporting the development of national, consensus performance standards, by the American National Standards Institute. We are participating actively in the new Steering Committee on Solar Standards Development, organized by the American National Standards Institute to expedite consensus standards for all aspects of the solar heating and cooling industry. This Committee, an ANSI innovation, has put together a solar standards development plan which will significantly reduce the time required to develop appropriate national solar standards.

Turning now to Part G, Subpart 3, entitled "Demonstration of Solar Heating and Cooling in Federal Buildings," I believe that such a program can have beneficial effects upon the solar industry by developing an early level of demand which can in turn encourage the industry to reduce prices, increase capacity, and improve its distribution and service capability. Members of the HUD solar staff have worked with the Federal Energy Administration and other agencies in the development of the Federal Solar Buildings Program, and much of what HUD has done in the development of solar standards, working with FEA, the Energy Research and Development Administration and the National Bureau of Standards, will assist in the implementation of the Federal Buildings Program.

But I do not believe that HUD will be directly involved in implementing this program, since this Department does not own any building properties which fall under the scope of this proposed legislation. I do offer our help in any way possible to agencies which are participating, and I believe that the continuing HUD residential demonstration program will help reinforce the efforts of the Federal Solar Buildings Program and other solar program activities in bringing about an effective and economical solar industry.

Mr. Chairman, this concludes my prepared statement. I would be pleased to answer any questions the Committee may have.

Senator JOHNSTON. Dr. Ambler.

STATEMENT OF DR. ERNEST AMBLER, ACTING DIRECTOR, NATIONAL BUREAU OF STANDARDS, ACCOMPANIED BY DR. J. E. SNELL, MANAGER, ENERGY CONSERVATION PROGRAMS

Dr. AMBLER. Thank you, Mr. Chairman. My written statement contains a list of things we have been involved in at the Bureau of Standards in energy conservation over the last few years.

In my oral statement, I would like to indicate a few points. First of all, each of the measures being discussed this morning—existing residential buildings, Federal buildings, and hospitals—deals with a significant element of the national economy.

The proposed conservation measures are based on technology of demonstrated effectiveness for saving energy. In general, it seems to

us, the overall picture regarding standards for materials and installation practices are adequate. However, it is generally experienced, whenever specific changes are made such as more or new insulation of housing, we have to be careful to avoid unintended side effects.

For example, again considering insulation, let me share our concerns with several side effects that could result from increased insulation requirements. These concern fire safety and moisture degradation. The fire hazard due to exposed cellular plastic insulation has been amply demonstrated in laboratory tests. The situation has been recognized. As a result, all model building codes now require foam plastic insulation installed in walls or ceilings of residences be covered with at least a half inch of gypsum board.

However, relative to this, new test methods remain to be developed. The American Society for Testing & Materials is considering consensus standards to adequately characterize the fire hazard of these materials.

The fire risks in the building can be increased significantly by almost any insulation material if improperly installed. For instance, in contact with a source of heat. For example, the city of Denver has petitioned the Consumer Products Safety Commission to examine this hazard. They have cited 18 cases where they believe improper insulation or improper insulation materials have caused fires.

The second possible side effect of these measures is potential moisture buildup and the requirement for greater protection against condensation by use of ventilation, otherwise there will be unwanted consequences such as fungus growth, odors, and powerful effects to interior and exterior finishes.

Another concern is material degradation. Our own studies of a particular foam insulation represents a good case in point. In situ measurements of this foam in the NBS test house shows a constant linear rate of shrinkage over a period of 26 months and it has not yet leveled off. Total linear shrinkage at that time was 1.8 percent. Although this material had low thermal conductivity when measured in the laboratory, under the conditions experienced in the field, its effectiveness for use is seriously diminished by this shrinkage. We are working presently with the FEA, ERDA, the Department of Housing and Urban Development, the Federal Trade Commission, and the American Society of Heating, Refrigeration & Air Conditioning Engineers as well as model code groups to develop the needed standards and implementation mechanisms such as model codes, field inspection, and so forth.

I don't by any means regard these problems as insuperable. They will require the cooperation of many different groups, and I am very confident that these problems can be overcome. This concludes my oral comments.

Senator JOHNSTON. Thank you very much, Dr. Ambler. At this time I want to turn to the Federal Trade Commission representative. Do you have any questions?

Senator METZENBAUM. Just one. The NBS testing of Dr. Wanlass' motor, I understand you are projecting it will take 6 months to do that test; is that correct?

Dr. AMBLER. We have not begun to test it yet. We are presently negotiating with FEA to do some testing on the Wanlass' principle. We are estimating it will take us about 6 months.

Senator METZENBAUM. How long have you had it?

Dr. AMBLER. Dr. Wanlass has not supplied a motor yet.

Senator METZENBAUM. How long have you been in touch with Mr. Wanlass?

Dr. AMBLER. We contacted the Wanlass company first on May 6.

Senator METZENBAUM. I don't understand. There is such an emphasis on conservation, the Wanlass' motor is supposed to be an effective way of conserving energy. How do we expedite the bureaucracy so you move instead of just saying we haven't gotten it yet and that we have to negotiate with FEA, or some other agency?

Dr. AMBLER. In selecting a motor to test, it is necessary for us to identify a motor that is suitable for being modified according to Dr. Wanlass' principle, then to get it modified and tested. It is necessary to test the motor with regard to a number of factors, not simply the energy efficiency of the motor running at a given speed, but the starting torques, the stalling torques, the behavior of the motor under reduced voltage.

We have started the planning for it.

Senator METZENBAUM. How long is it going to take?

Dr. AMBLER. To complete the project it is our best estimate it will be about 6 months.

Senator METZENBAUM. If there were a war tomorrow morning, could you do it in 2 months; or the President called upon you and said we need to produce so many airplanes, could you do it?

Dr. AMBLER. We would certainly try, sir.

Senator METZENBAUM. Mr. Ambler, would you be good enough to advise me in writing what the timetable is and what you are going to do and why you can't expedite it?[1] I think too often governmental agencies drag their feet, and I understand you haven't even started on it. I would appreciate hearing from you what your program is and when it will be completed.

Dr. AMBLER. I will be glad to supply that information. I didn't want to give you the impression we had done nothing. We are planning the actual laboratory work now. We can start the laboratory work upon receipt of a prototype motor.

Senator METZENBAUM. Maybe my inquiry to you will indicate some of us have a sense of urgency.

[The prepared statement of Dr. Ambler follows:]

STATEMENT OF DR. ERNEST AMBLER, ACTING DIRECTOR, NATIONAL BUREAU OF STANDARDS

Mr. Chairman and Members of the Subcommittee: Thank you for this opportunity to testify here today on S. 1469, the President's energy proposal, known as the National Energy Act. I am accompanied this morning by Dr. Jack Snell, Manager of our Energy Conservation Programs at the National Bureau of Standards (NBS).

The National Bureau of Standards urges enactment of the President's energy conservation proposals as contained in the National Energy Act, and stands prepared to contribute significantly to their implementation.

[1] The answers appear in appendix I, pg. 493. See also FEA's letter in appendix I, pg. 491.

Each of the areas under discussion this morning—existing residential buildings, consumer products, schools and hospitals, and Federal buildings and operations—deals with a significant element of the national economy. Effective implementation of the measures proposed by the President for these areas will require an intensified effort by all concerned.

By way of overview, I would like first to say a few words about NBS and the history of our involvement in energy conservation, and then review Parts A, B, C and G of Title I in light of our experience.

National Bureau of Standards.—Energy conservation has been a priority program at NBS for most of this decade.

NBS has developed, over a period of years, technical competences in many areas of technology germane to energy conservation. Specifically, these include building research, fire safety, and consumer products. NBS is chartered (15 USC 272) to provide technical bases for standards, performance criteria, measurement technology, and technical assistance to other agencies of Government—local, State, and Federal—to industry, and to consumers. NBS serves as the Department of Housing and Urban Development's (HUD) technical arm by Secretary-to-Secretary agreement; has a Memorandum of Understanding with the Energy Research and Development Administration (ERDA); and Interagency Agreements with the Federal Energy Administration (FEA), Community Services Administration (CSA), and the Department of Defense (DOD) for support of programs in energy conservation.

In FY 1977 we expect this program to be a roughly 150 work-year effort including some $13 million, principally other agency funds.

PART A—ENERGY CONSERVATION PROGRAMS FOR EXISTING RESIDENTIAL BUILDINGS

Part A of Title I of S. 1469 is entitled Energy Conservation Programs for Existing Residential Buildings. Nearly 20 percent of the total energy used in the United States is for heating and cooling buildings. Many buildings needlessly waste as much as half of the energy they consume. Provisions aimed at reducing energy waste in buildings are essential elements of a comprehensive national energy policy.

I shall comment only on Subpart 1 of Part A entitled Utility Program. The Utility Program is built around the voluntary installation by residential utility customers of suggested "residential energy conservation measures." The success of this program will depend on the energy savings and cost-effectiveness of the suggested measures; the availability of standards and good installation practices to apply them properly and safely; and the availability of the technical data and other promotional and educational materials needed for communicating convincingly to the Nation's 74 million householders the personal benefits and national importance of their investing in these voluntary measures.

Effectivenes of Energy Conservation Measures.—Section 101 lists "residential energy conservation measures" from which the Administrator of FEA may by regulation suggest for buildings by category and location. All these measures have demonstrated effectiveness in reducing energy waste in existing buildings. For example, NBS has conducted a series of experiments on a wood frame residence here in Washington to evaluate actual energy savings from several of these measures. These included reducing air leakage through caulking and weatherstripping; adding storm windows; and installing insulation in the floor, ceilings, and walls. The addition of storm windows reduced heating energy requirements by 25.2 percent. The installation of insulation in the walls, ceilings, and floor reduced heating energy consumption by 33 percent. The total reduction in heating energy achieved by all stages of the retrofit on this house was 58.5 percent.

NBS has also conducted field studies of the furnace efficiency modifications specified in the Act. These studies on oil burners in New England showed fuel savings potentials of 14 percent from firing rate reductions with modifications made to burner air handling equipment and 30 percent from new, more efficient burner installation and firing rate reductions to properly match heating requirements. NBS computer analyses have indicated energy savings ranging from 4 to 13 percent by substitution of automatic ignition for a pilot light in gas-fired furnaces. Energy savings of 4 to 8 percent are achievable by blanketing gas and electric hot water heaters with appropriate types of additional insulation.

With regard to another specified measure, the clock thermostat, NBS in 1973 measured energy savings of 10 percent from nighttime thermostat setback from 75°F (24°C) to 65°F (18°C) in a townhouse in our environmental chamber. Several computer studies and field experiences of others have shown similar findings.

These and other experiences attest to the effectiveness of the measures proposed in Section 101.

With regard to installation of solar components and systems, standards are being developed in the context of the National Solar Heating and Cooling Demonstration Program. Our laboratory and field studies confirm the statement made recently by Sheldon Butt, President of the Solar Energy Industries Association, that determined conservation efforts should accompany the development of solar energy for buildings. Obviously, smaller heating and hot water demands would require smaller and less expensive solar hardware.

The principal thrust of the President's program is to achieve major reductions of energy use in existing buildings between now and 1985. Nonetheless, the need for reduction of energy waste in new and existing bulidings and the rise of energy prices are expected to continue through the end of the century. It will be very important to develop improved efficiency energy conservation measures and the criteria needed to assure their effectiveness. NBS is working closely with ERDA and others in this regard. We must assure that these programs do not discourage innovation. Guidelines or special provisions for innovative technologies need to be developed. We expected the FEA procedures for the Utility Program will take advantage of the potential benefits of these new technologies.

Applying the Technology Availability of Standards, Know-How, and Practices.—As I pointed out earlier, the success of this program will depend upon how effectively the available conservation measures are applied. Do-it-yourselfers, contractors, technicians, architects, and engineers must have guidelines, procedures, and standards to apply these techniques successfully.

In assessing the state of the art in applying energy conservation measures it is convenient to consider four elements in the application of such measures. These are: (1) guidelines or standards to which materials or equipment are designed and manufactured; (2) the means an industry or the building community uses to be assured that materials and equipment produced meet these requirements; (3) the procedures and mechanisms to assure that energy conservation materials and equipment are properly installed and tested; and (4) adequate knowledge, practices, and test methods to assure the continued effectiveness of these measures over their useful lives.

NBS has been working with FEA, ERDA, and others for several years in addressing needs in each of these areas. Let me say a word about each of them relating this experience specifically to Section 102 of Part A. This section requires the Administrator to develop rules for the content and implementation of residential energy conservation plans defined in Section 101.

In anticipation of proposed legislation concerning retrofit tax credits in 1975, FEA requested NBS to recommend the criteria to be used for considering materials and products eligible for tax credit. As a result, in November of 1975, NBS published NBSIR 75–795, *Recommended Criteria for Retrofit Materials and Products Eligible for Tax Credit.* There are several things I should mention about this report. It represents a snapshot of a rapidly changing situation in terms of materials standards and practices. NBS is presently under contract to revise and expand this set of criteria for the FEA weatherization program. The availability of the revised criteria for public review and comment has been announced in the *Federal Register.* Later this week NBS is holding a public meeting to review public and industry response to these criteria. These and other materials will be used in establishing a final suggested measures list to be published by FEA in developing the rules specified under Section 102 of the proposed legislation.

Unquestionably, available insulation materials and procedures can be used to meet much of the demand that will be stimulated by the President's goals. Existing standards are adequate for many of these materials, particularly certain types of mineral fiber, mineral cellulose, and organic fibrous materials as noted on Table 2 of NBSIR 75–795. Further, materials which meet the American Society of Testing and Materials (ASTM) standards for organic fiber and organic cellular insulations and which also conform to the fire safety requirements outlined in NBSIR 75–795 are suitable for use. Materials meeting these

standards meet minimum requirements for heat flow resistance, fire safety, and quality.

Unfortunately, many currently marketed materials and insulation practices do not meet these requirements. Moreover, the fire safety recommendations in NBSIR 75–795 were not based on extensive test data and need to be evaluated.

For example, the fire hazard due to exposed cellular plastic insulation has been amply demonstrated at the University of California and the Underwriters' Laboratories amang others, even for materials that pass the presently accepted flammability test. There have also been some fires involving loss of life in buildings resulting from exposed cellular plastics. Because of these fires and due to Federal Trade Commission (FTC) action, the foam plastic industry now recommends that cellular plastics be covered by a fire barrier equivalent to ½ inch of gypsum board. The model building codes have also been changed either to accept this prescription or to validate the use of the chosen material based on its performance in a room fire test.

There is a need to provide a technical base on which to establish the significant fire risks due to the installation of the various kinds of insulation in new and existing housing, to determine the laboratory test methods best suited to evaluate the material with respect to these hazards, and to specify the test criteria which the material must pass before it can be approved for insulation of buildings.

Insulation may increase the fire risk by (1) increasing ignition possibilities, including smoldering ignition; (2) contributing to fire growth in an enclosure; (3) providing a path for fire to spread throughout the building; (4) reducing the fire endurance of a fire rated wall if it is combustible; or (5) adding to the generation of smoke and toxic gases. The extent to which the insulation can potentially contribute to any of these hazards depends on the type of material, method of application, location, and whether it is exposed or protected. For example, cellulosic, glass fiber, and plastic foam insulation materials can undergo smoldering combustion. Underwriters' Laboratories currently recognizes this problem for loose fill shredded wood and paper materials, although no generally acceptable test method is available to determine this important property.

The main types of insulation that need to be considered are: (1) mineral wool, (2) glass fiber, (3) shredded wood and paper, (4) urea formaldehyde, (5) polyurethane, and (6) polystyrene. The material may be in any of the following forms: boards, blocks, sheets, blankets, batts, felts, loose fill (poured or blown), or foamed in place (poured or sprayed). The insulation may also have combustible or noncombustible facing. The insulation may be concealed or exposed.

Planned studies can produce interim acceptance fire performance criteria for questionable materials in one year. Presently, NBS scientists and engineers are working with ASTM Committee C–16, a special committee of the Building Research Advisory Board, and colleagues in FEA, ERDA, the General Services Administration (GSA) and industry in reviewing current standards and outlining efforts required to assure effective materials standards, test methods, and recommended practices are available for thermal insulating materials. This effort parallels and will contribute substantially to subsequent revision of NBSIR 75–795. Also in response to recent requests from industry, NBS is developing plans for a joint NBS/ERDA study of the thermal, fire, and durability performance of insulating materials. This program will include development of test methods and measured data on the response of various insulation materials to moisture and to degradation, and will provide performance criteria for innovative insulating materials and systems. Further, these efforts will involve development and use of facilities to produce data on the "as-built" performance of complete wall, floor, or ceiling sections. In November 1975, NBS published Building Science Series No. 77, a report on the *Acoustical and Thermal Performance of Exterior Residential Walls, Doors, and Windows*. This document reported laboratory tests conducted by Owens-Corning Fiberglas Corporation on thermal transmission, air leakage, and sound transmission losses of a limited number of full-scale wall sections. The planned studies will result in development of commercial test methods for *all* types of insulating materials and systems and their effectiveness in actual building elements.

NBSIR 75–795 presents criteria for the other energy conservation measures listed in Section 101 with the exception of furnance retrofit devices. Standards for these either presently exist or are under development, and should be available in time for reference in this program.

The next major area of concern in assuring effective application of energy conservation measures are the technical practices and institutional mechanisms for assuring that manufactured materials and products meet these standards. In the area of thermal insulation, industry has requested the Department of Commerce (DoC) to provide a program for the accreditation of testing laboratories that furnish technical data or facilitate certification for its products. Under its National Voluntary Laboratory Accreditation Program (NVLAP), DoC has published (March 10, 1977) its preliminary finding that a need for accredited laboratories exists in this area. The NVLAP process (15 CFR Part 7) would result in the establishment of criteria and procedures for laboratory accreditation within 15 months and with the expectation that most testing laboratories in this field would be accredited by DoC inside 2 years. NVLAP provides the means of effective implementation of standards and test methods and for their extension and improvement as operating experience is fed back to standards-writing bodies. NBS is presently exploring possible opportunities for acceleration of this program in helping the insultation industry respond responsibly in this critical period of greatly increased demand for their products.

Further, NBS is working with ASTM Committee E–06 and its Subcommittees in developing improved test methods for the thermal and air leakage performance of windows and as well for air infiltration in new and existing buildings.

The third important area of concern in assuring effective implementation of energy conservation measures is installation practices. Technical information on proper installation of most insulation materials is available. However, the effectiveness of most insulation materials is highly dependent upon how faithfully these procedures are followed in practice. There are few simple or effective mechanisms for field quality assurance of insulation effectiveness in retrofit. Installation of attic insulation can be inspected visually. Bag or wrapper counts can be used to assure that appropriate quantities of material have been applied. However, exterior wall and often crawl space installations pose more difficult problems. Available thermographic techniques are costly. Heat flow meters are very time consuming and highly subject to operator error or interpretation.

Under FEA sponsorship NBS has developed and FEA is soon to release a serviceman's guide for nozzle size modifications on oil burners. NBS and others have developed handbooks with suggested practices for a variety of others of the retrofit measures being considered. Further, the American Society of Heating, Refrigerating and Air Conditioning Engineers is developing a standard for energy conservation in existing buildings. I believe that document should include, at least, suggested procedures for installation quality assurance of energy conservation retrofit measures.

In the final analysis the most effective means of assuring satisfactory results from retrofit measures is the good name and integrity of the installing contractor.

The last major area in assuring effectiveness of energy conservation measures is actual in-service performance over the lifetime of the energy conservation measure. Most materials or products contained on the list of suggested measures in Section 101 have been in use for many years and a great deal is known about the durability and reliability of these items. This is not the case for innovative materials or new insulating systems or equipment. NBS will be working closely with FEA, ERDA, and others in developing performance measures and collecting laboratory and field data to assure that the intensive application of building retrofit measures in the coming decade does not itself stimulate major repair or reinsulation requirements.

Public Information and Education.—Data, illustrative examples, and general information and educational materials will need to be made available to building owners and occupants for their use in decisionmaking about these various energy conservation measures. Few people will be willing to invest or even apply for the incentives being suggested unless or until the benefits to them have been demonstrated clearly. This points to an essential need for measured data on actual achieved energy savings (and cost reductions) from installation of suggested energy conservation measures. We believe this is an area where the credibility of Federal information is extremely important.

Another important area of sensitivity in this regard is the information provided to building owners and occupants for their use in actual decisionmaking about these measures. I am referring specifically to the means used my homeowners in determining which combinations of these energy conservation measures makes most sense for his particular household or home. We have abundant data demon-

strating the wide range of energy usage in identical dwellings resulting from differences in occupancy and behavioral patterns as well as the particular details of design and construction. Further, individual families will have their own preferences and comfort idiocyncrasies. Simple national or even regional prescriptive solutions may not be effective in meeting individual needs.

The NBS, HUD, and others have in recent years published documents aimed at consumers and intended for their use in making these decisions. Two specific examples are the NBS Consumer Information Series document, "Making the Most of Your Energy Dollars," and the HUD publication, "In the Bank or Up the Chimney." Further, FEA has experimented with a variety of other mechanisms for assisting homeowners in making choices about energy conservation measures.

PART B—ENERGY EFFICIENCY STANDARDS FOR CONSUMER PRODUCTS

Part B of Title I is entitled Energy Efficiency Standards for Consumer Products. It would amend Part B of Title III of the Energy Policy and Conservation Act (EPCA) to substitute reliance on voluntary efforts to meet industry-wide average energy efficiency targets for consumer products other than automobiles with a program of mandatory energy efficiency standards prescribing minimum levels of performance.

NBS has had considerable experience in the area of energy efficiency of consumer products. In late 1973, the Department of Commerce launched a program which sought the voluntary labeling for energy efficiency and cost of operation of major appliances by manufacturers. The program had been finalized for four appliances, room air conditioners, refrigerators, refrigerator-freezers, and freezers.

In 1975, the Department of Commerce, in addition to this labeling program, proposed energy efficiency targets to be voluntarily achieved by 1980.

The Department programs for voluntary labeling and voluntary compliance with energy efficiency standards were for all practical purposes terminated by the enactment of EPCA on December 22, 1975, which established a new program to be managed by FEA and FTC. At the present time we have provided FEA with test procedures for all products listed in EPCA except for furnaces and certain vented space heating devices which by nature are related to furnaces. They will be forthcoming soon. In all, taking into account that different test procedures are required for given products having different fuel sources, we have supplied about 30 test procedures.

FEA was given responsibility in the area of energy efficiency targets. Similarly, in the present efficiency target program we have supplied targets to FEA for the first 10 product areas, a total of 26 targets. We will supply them for the remaining 3 product areas in the near future.

Under EPCA as amended by P.L. 94–385, the Energy Conservation and Production Act (ECPA), the National Bureau of Standards was assigned a responsibility in addition to developing and recommending test procedures. That responsibility was to develop the energy efficiency improvement targets. While no final targets have yet been published, the EPCA maintains a target compliance date of 1980. This target date means that all tooling changes, design modifications, etc., necessary to produce products which could meet the voluntary standards would have to be in place by the end of 1979. Industry needs time to redesign, retest, and retool; three years not being uncommon. The delays caused by the enactment of EPCA and the absence of published final targets at this date make the time available for significant changes by industry to meet the energy saving requirements perilously close.

Further, it is essential that consumer demand for more efficient products, usually at a higher initial cost, be sufficient to warrant compliance with the voluntary efficiency improvement targets. No company would be willing to voluntarily produce products that it cannot sell.

Consumer demand can be enhanced by the labeling of consumer products that display their energy efficiency and cost of operation, thereby creating a market for more efficient products. Since no labels are yet available, this cannot be done and time continues to pass. For these reasons we feel the President's proposal for leaving the time schedule up to the Administrator and providing him with the option of including certain products is excellent.

The amendment to EPCA proposed by the President leaves intact the responsibility of NBS to provide FEA with test procedures. We welcome this continuing responsibility. We have been informed by officials at FEA that they will continue to use NBS assistance.

PART C—ENERGY CONSERVATION PROGRAM FOR SCHOOLS AND HOSPITALS

Part C of Title I is entitled Energy Conservation Program for Schools and Hospitals. It would amend Title III of the Energy Policy and Conservation Act by including a new part which provides Federal assistance for energy conservation retrofit of existing schools and hospitals through State energy conservation programs. There are very siginficant opportunities for energy savings in these types of institutional buildings. Schools and hospitals account for roughly ⅛ of commercial building energy use. Our own work gives some evidence of the potentials.

The list of energy conservation measures included in Section 391 of proposed Part C contains a number of important means for reducing energy use in such buildings. However, this is not an inclusive list. There are numerous other measures that could have as significant impacts on reducing energy use. NBS stands prepared to assist FEA in developing suitable performance criteria for the measures on the list as well as for other energy conservation measures States may wish to adopt.

Also, the FEA guidelines should include standards for general safety and effectiveness of suggested measures, standards for installation of these measures, and other such requirements as the Administrator determines to be necessary to assure the effectiveness of energy conservation measures included in State plans. We believe such provisions with respect to schools and hospitals are as important as such provisions are to residential applications (see Subsection 102(b) of Part A).

The American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) is developing a standard for energy conservation in existing institutional buildings (ASHRAE 100.5P). A draft for public review and comment is scheduled for publication in July. NBS would be pleased to assist FEA, ERDA, and others in reviewing and possibly adapting this standard for use or reference in the Administrator's guidelines.

PART G—FEDERAL ENERGY INITIATIVES

Part G of Title I is entitled Federal Energy Initiatives and contains proposals for energy efficiency in Federal buildings and operations. Certainly, the Federal Government should set an example in the use of new technologies such as solar heating and cooling, as well as other energy conservation measures. Subpart 3, entitled Demonstration of Solar Heating and Cooling in Federal Buildings, provides a mechanism for FEA to assist Federal agencies in undertaking solar heating and cooling demonstrations in their buildings.

We presume this program will be coordinated closely with ERDA's efforts in implementing P.L. 93–409, the Solar Heating and Cooling Demonstration Act. That program has already supported a number of Federal building solar heating and cooling demonstrations. This provision will extend that experience to embrace a broader number and range of such demonstrations.

Further, we assume that many of the products of and experience from the ERDA demonstration program would be useful to FEA in implementing this program. For example, several such demonstrations that we at NBS have been involved with include the GSA Demonstration Office Buildings in Manchester, New Hampshire, and in Saginaw, Michigan, and technical assistance to the Veterans Administration.

NBS has the responsibility, under P.L. 93–409, to develop definitive performance criteria for solar hot wate, heating, and combined heating and cooling systems as part of the National Solar Heating and Cooling Demonstration Program for ERDA and HUD. NBS has already produced interim criteria for solar hot water and heating systems and test methods for rating of solar collectors and storage devices. ASHRAE has just recently approved standards for the latter based on this NBS work. Further, NBS has developed interim performance criteria for solar heating and cooling systems in commercial buildings that should be useful to both FEA and other Federal agencies applying for assistance under this program.

NBS is prepared to support FEA in developing guidelines for this program and in providing technical assistance to FEA if requested in assessing the performance of demonstration systems. This may be important since a number of significant problems have occurred with several solar heating and hot water systems currently in operation.

Most of these problems involve durability/reliability. For example, five out of seven collector types being used to heat a commercial building at the National Aeronautics and Space Administration Langley, Hampton, Virginia, showed more

than a ten percent deterioration in collector thermal performance after exposure (under "no-flow" conditions) for three to nine weeks. Other problems include outgassing of materials inside collectors which causes reduced heat output, glass breakage, and leakage in liquid systems; and the possibility of health and safety problems associated with toxicity of flammability of heat transfer fluids used.

Problems of this sort typically are encountered in the early phases of development of a new industry. Demonstrations such as this one are useful in shaking out these problems and developing effective standards and guidelines for practice for more rapid commercialization of new technologies.

SUMMARY

The principal thrust of my comments is that the proposed energy conservation measures are badly needed, they are of demonstrated effectiveness and, with prompt attention to certain inadequacies of available technology, they can be implemented to contribute substantially in meeting the President's goals for energy conservation. The National Bureau of Standards has solid competences in measurement and standards technology, particularly in the areas of building research, fire safety, and consumer products needed in resolving the technical problems I have dientified. It will take intensified efforts on the part of all of us—Government, industry, and energy end users—to get this job done.

Senator JOHNSTON. The next witness is Mr. Reich.

STATEMENT OF ROBERT B. REICH, DIRECTOR, OFFICE OF POLICY PLANNING AND EVALUATION, FEDERAL TRADE COMMISSION

Mr. REICH. Mr. Chairman, for the sake of brevity, let me submit for the record my prepared testimony and bring to the committee's attention a report prepared by the staff of the Federal Trade Commission which addresses in some detail several of the potential consumer protection and competitive problems that we are concerned about in the legislation and poses some solutions.

In the next 5 minutes, I will simply highlight.

Senator JOHNSTON. I would say at this point we will submit your statement and your list to each of the witnesses today and ask for comments in writing. I think those were excellent suggestions you had.[1]

Mr. REICH. Most of our concerns involve part A which involves public utilities in the combined role of advising customers of the need for insulation, providing insulation, and financing the insulation. One potential problem is utilities now are exempt from truth-in-lending laws and the Fair Credit Billing Act for most services they now perform. If this exemption applies as well as to their financing of home insulation, consumers will be effectively barred from protection in that legislation.

Some utilities right now have misconstrued the Truth-In-Lending Act. Some utilities now involved involuntarily in providing financing and advising consumers have interpreted that Truth-In-Lending Act to allow them not to comply with those provisions.

We would recommend an express clause as to that.

Senator JOHNSTON. Wouldn't this be better than to put this in the bill, to have a uniform rate, just not allow that difference in rate? He may not charge more than x percent.

Mr. REICH. The Truth-In-Lending Act has all the protection and not just disclosure rates by a 3-day cooling-off period for home insula-

[1] Administration responses to issues raised in the FTC testimony are printed in the appendix.

tion, if you don't need it or you don't want it after you have been sold it, there are a variety of protections Congress built into that.

The Fair Credit Billing Act provides dispute billing settlement procedure which consumers have found enormously useful. Also, it is not applicable to open-end credit accounts that would include, presumably, some of these billing systems that utilities would be using under the proposed legislation and the report to which I referred gets into that in somewhat more detail, Mr. Chairman.

A second potential problem arises because utilities, unlike other financers, have at their disposal a potentially coercive debt collection technique which is simply the threat, if not the actualization, of termination of service, on failure to pay.

If the consumer finds the insulation is defective and wishes to withhold payment to preserve his claims and defenses, it may be difficult for him, or he may face that kind of a threat and we would recommend a portion of the utility bill applicable to the home insulation, utilities not be permitted to terminate service for that.

Senator JOHNSON. How would that work? You would have to pay 90 percent of the bill, the other 10 percent that went for insulation——

Mr. REICH. Perhaps that at least the bill should be segregated so the consumer can know what part he is paying for insulation and what part he is paying for the utilities. Right now among the utilities that voluntarily provide financing of insulation, there is no such segregation made. A consumer has no way of knowing, so your possible remedy is there may be a way to rectify that if the bill is segregated.

Third: The legislation, we think, needs to be clarified to expressly save the Federal Trade Commission's existing statutory and enforcement authority to remedy deceptive or unfair trade practices in the provision of insulation or retrofitting under a utility program.

I don't think I have to point out to the committee, the home insulation and home improvement business has generated enormous consumer complaints over the past years. Consumers have been victimized by poor materials, improper installation, shoddy workmanship, and incomplete work. We think it is important, at the very least, such rules as the holder-in-due-course rule and the cooling off rule should be available to consumers.

Finally, I wish to highlight a fourth troubling aspect of the proposed legislation. By putting utilities in the combined role of appraiser, supplier, and financer. we think the proposed legislation may open the door to certain competitive abuses.

By both advising their customers of the need for insulation and supplying it, utilities may be tempted to overstate the need. By virtue of their special access to consumers, utilities may have a distinct marketing advantage over other suppliers and financiers of home insulation. They, therefore, may be able to overcharge for supplies, services, and capital.

By the same token, they may be able to underprice their home insulation competitors and recover the difference in higher energy rates.

Fourth, there is some possibility that they might tie their provision of home fuel to particular energy saving devices that only they can supply. They should be allowed to enter the supply and installation business only if they enter as direct competitors of existing businesses and not utilize subcontractors.

Senator JOHNSTON. Would you repeat that?

Mr. REICH. They should be allowed to enter the supply and installation business only if they enter as direct competitors of existing businesses and do not use subcontractors. The notion is if they use subcontractors, they don't actually increase the supply of contracting services which most of them now in the business do not; most of them subcontract. They are not actually competing with the existing supply of subcontractors, they are simply incorporating part of that supply and potentially reaping higher competitive advantages and noncompetitive profits, than any potential competitor.

I hasten to add this parade of horribles is hypothetical. Each requires further extensive examination. There is also the question raised by the committee concerning the supply of actual insulation materials and the Federal Trade Commission has done a preliminary investigation.

The staff is now conducting a further investigation, extensively, of the supply and demand in the insulation manufacturing market. The regulation does require that each State regulatory authority submit a plan to be approved by the FEA Administrator which is an adequate program.

The proposed legislation does require that each State regulatory authority submit a plan, to be approved by the FEA Administrator which contains an adequate program for preventing unfair, deceptive, or anticompetitive acts or practices which relate to the implementation of the utility programs.

But the questions remain: Are State utility agencies regulatory authorities sufficiently expert in consumer protection matters to adequately police these transactions? Are consumers adequately represented on such bodies? We tentatively decided, no. Other additional safeguards have to be built in.

Senator JOHNSTON. Let me say first of all, I quite agree. I don't think you can leave this up to the States. The States, by and large, do not have the expertise. We ought to have a national standard, and I think we ought to require it.

I am very concerned about the position we are putting these utilities in. We are saying we have got to insulate, we have got to go out and make this available. Then you are going to allow the utilities to get right into business or they are not going to have adequate protections where they can—I think the potential for abuses are absolutely monumental in this case.

It seems to me the Government has, and I usually resist getting the Government in these things any more than is necessary, but it seems to me we have to have some kind of Government certification, Government standards like FHA, so the customer will know what he is getting.

There is a worse potential here than aluminum siding.

Mr. REICH. Mr. Chairman, we have, over the years, as I am sure you know, received a number of complaints on aluminum siding and part of the fact is there were no standards, not only are there no standards but it is difficult for consumers to make comparative judgments as to the efficacy of different kinds of insulators.

We are happy and encouraged by the response of the National Bureau of Standards and several agencies are now giving to this problem, and we hope to work very closely with them.

There is a potential competitive problem to which we need to be sensitive in the creation of standards. Many of the standards we have were developed in large part by the industries to which the standards are to be applied. We need to develop procedures to adequately assure there are not embedded in the standards, barriers to entry or barriers to competition.

I flag that as a problem to which we are sensitive and I am sure several of the other agencies now developing standards are now using——

Senator JOHNSTON. I agree with that, but wouldn't we be better off having FHA do those standards than having the local utility?

Mr. REICH. I would say so.

Senator JOHNSTON. The potential abuse with a local utility, particularly if they can do it themselves, is absolutely incredible. They buy the window sealer company and say: You need insulation; Government requires it; we will refer you to our Government certified contractors. That is incredible to me. We will have that sort of thing.

Mr. REICH. All I can say is: Mr. Chairman, we share your concern.

Senator JOHNSTON. What I wish you would do is help us, give us some thoughts as to how we could have a Government-certified program. As an example, I mentioned the FHA. We need some way to solve these barriers to entry, and competition, and to give to the consumer that Government-certified package that he seeks in an area where there are no standards.

Senator METZENBAUM. I don't have any questions. I do share the Chairman's concern and I do appreciate the statements of Mr. Reich on this subject. I think your direction and motivation are excellent.

I am kind of ambivalent as to whether or not we would be better having utilities doing it, having a sense of responsibility, or as the Chairman points out, the problems of doing it that way are whether you have Government-certified people.

The fact is, when you look out on the field and see who might do this kind of work for the Government, you do find the siding people, in the main the most logical ones, the ones most likely to move into this gap. Their record consumerwise is not a good one. I think it is an area that particularly lends itself to some direction and suggestions and I think it is important we have that exchange between your agency and the rest of the administration who have formulated and developed this program so we in Congress may try to provide the best way to effect consumer protection. We have holder-in-due-course problems in that you don't have usual rules applying to the utilities.

Maybe there ought to be something in about a fair profit. Maybe there ought to be something in the statute, but I will say I share the concern. I think we have all stated the problem. I am not sure anybody has stated the solution. I think that is where we are and I think we need to do it rather rapidly.

Senator JOHNSTON. Thank you very much. I am sorry we have not had more time for you. We got here as early as we could.

[The prepared statement of Mr. Reich and attachments follow:]

STATEMENT OF ROBERT B. REICH, DIRECTOR, OFFICE OF POLICY PLANNING AND EVALUATION, FEDERAL TRADE COMMISSION

I am Robert B. Reich, Director of the Office of Policy Planning and Evaluation of the Federal Trade Commission, and co-Chairman of the Commission's Energy

Task Force. I am happy to be here today to discuss certain provisions of the proposed National Energy Conservation Act.

At the outset I should emphasize that I am here as a staff member and that my views do not necessarily represent the views of the Commission or any Commissioner. Recently the Chairman of the FTC, Michael Pertschuk, appointed an energy task force to examine the likely impact of the proposed National Energy Act upon consumers and competitive markets, and to propose specific initiatives to protect consumers from fraud and to ensure that competition is unimpaired. The Task Force has prepared a report which focuses upon potential consumer and competitive problems in the proposed legislation, and recommends specific amendments to remedy those problems. My testimony today will highlight that report, which is appended.

Most of our concerns involve part A of the proposed legislation, which puts public utilities into the business of advising their customers of the need for home insulation, supplying the insulation, and financing the purchase. This amalgam of roles raises potential troubling consumer issues.

Public utilities are exempt from the Truth-in-Lending Act and Fair Credit Billing Act for most services they now perform. If this exemption applies as well to their financing of home insulation, consumers will not be informed of interest rates they are being charged for this service, and will not be able to dispute alleged billing errors as they would if they had obtained the insulation and financing from third parties. The consumer may have no way of determining what portion of his utility bill is attributable to payment for home insulation, interest, or utility service. By the same token, public utilities will enjoy the competitive advantage of immunity from the administrative burdens of these legislative schemes relative to other suppliers and financers of home insulation.

The Federal Trade Commission does not construe Section 104(4) of the Truth in Lending Act to authorize an exemption for extensions of credit by utilities for the purpose of home insulation or retrofitting. Some utilities currently sponsoring programs similar to the utility program required in the bill, however, have failed to comply with applicable consumer credit protection laws. Explicit clarification. therefore, is warranted.

A second potential problem arises because utilities, unlike other financers, have at their disposal a potentially coercive debt collection technique: if the insulation or its installation is defective and the consumer therefore chooses to withhold payment, the utility might attempt to retaliate by terminating service and thereby jeopardizing the health and safety of the debtor. Accordingly, where the debt to the public utility is a result of energy conservation measures purchased or financed by the utility, termination should not be permitted for nonpayment.

Thirdly, the legislation should be clarified to expressly save the Federal Trade Commission's existing statutory and enforcement authority to remedy deceptive or unfair trade practices in the provision of insulation or retrofitting under a utility program. In particular, the FTC's rules preserving consumer claims and defenses against holders-in-due-course and mandating a three-day cooling-off period for door-to-door sales, should be applicable to these transactions.

The home improvement business has generated a large number of consumer complaints. Consumers have been victimized by poor materials, improper installation, shoddy workmanship, and incomplete work. Low income consumers have been particularly vulnerable to exaggerated or deceptive claims and marketing techniques in this area. These problems are attributable, in part, to the lack of standard measures for judging the efficacy of home improvement materials, such as insulation or solar devices. Moreover, because home improvements often constitute substantial, non-repeat purchases, the average consumer has little market experience upon which he can rely in making decisions. Finally, it is often difficult for the consumer to ascertain whether the work has been completed properly; the consumer may suspect that home insulation buried behind the walls is unsatisfactory only when he scrutinizes his utility bills over an extended period of time.

The abuses which have occurred have been rendered all the worse by the practice of taking second mortgages to secure credit obligations arising from the home improvements, and the application of state laws creating mechanics and materialmen's liens in the improvements and property in which they are made.

The retrofitting and weatherization initiatives built into the National Energy Act can be expected to increase substantially the demand for such service. In light of this increase, the Holder-in-Due-Course Rule and the "Cooling-Off" Rule should be available to consumers.

Finally, I wish to highlight a fourth troubling aspect of the proposed legislation. By putting utilities in the combined role of appraiser, supplier, and financer, the proposed legislation may open the door to competitive abuses. By both advising their customers of the need for insulation and supplying it, utilities may be tempted to overstate the need. [By virtue of their special access to consumers, utilities may have a distinct marketing advantage over other suppliers and financers of home insulation; they therefore may be able to overcharge for supplies, services, and capital. By the same token, they may be able to underprice their home insulation competitors and recover the difference in higher energy rates.] Lastly, there is the danger that they might tie their provision of home fuel to particular energy-saving devices that only they can supply.

We recommend, therefore, that public utilities should not be required to offer to install suggested energy-saving measures. Moreover, they should be allowed to enter the supply and installation business only if they enter as direct competitors of existing businesses; subcontractors should not be utilized.

Additional safeguards should be considered to assure that utilities entering the market directly do not take unfair advantage of their appraisal role. One such safeguard would be a requirement that utilities inform customers of all companies willing to perform an initial inspection and appraisal of residential needs, supply and/or install conservation measures, or provide financing.

Finally, utilities should be prohibited from recovering any of the cost of providing these services within utility rates charged across-the-board to all customers.

I hasten to add that the parade of horribles I have suggested is purely hypothetical, and each of these possibilities requires extensive further examination. [The proposed legislation does require that each state regulatory authority submit a plan, to be approved by the FEA Administrator, which "contains an adequate program for preventing unfair, deceptive, or anticompetitive acts or practices . . . which relate to the implementation of the utility programs." But the questions remain: Are state utility agencies regulatory authorities sufficiently expert in consumer protection matters to adequately police these transactions? Are consumers adequately represented on such bodies?]

Mr. Chairman, that concludes my prepared testimony. I will be happy to answer any questions you may have.

ATTACHMENT A.—FEDERAL TRADE COMMISSION COMMENTS ON TITLE I, PART A, NATIONAL ENERGY ACT BILL, H.R. 6831

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I. FEDERAL TRADE COMMISSION JURISDICTION

PROBLEM:

Subsection 102(d)(2) of the National Energy Act bill requires participating states to submit for Federal Energy Administration approval programs "for preventing unfair, deceptive or anticompetitive acts or practices" in the implementation of utility programs. Because this language mirrors that of Section 5 of the Federal Trade Commission Act, 15 U.S.C. §45, it is at least arguable that § 102(d)(2) effectively transfers jurisdiction over such acts or practices from the Commission to the FEA. A variant of this argument prevailed in FTC v. Miller, 549 F.2d 452 (7th Cir. 1977). Alternatively, a regulated utility might argue that so long as its conduct conforms to a § 102(d)(2) program imposed by a state utility commission, the Federal Trade Commission may not preempt state action by finding such conduct violative of Section 5 of the Federal Trade Commission Act. Cf. Parker v. Brown, 317 U.S. 341 (1943). Also, it might be argued that the bill authorizes the Federal Energy Administration to exempt public utilities from complying with existing or future Trade Regulation Rules in their implementation of utility programs. Although these arguments may not be legally sound, the statute should effectively preclude them.

SOLUTION:

A saving provision should be added to Section 106 to protect the Commission's existing statutory and enforcement authority. It should assure that in the unlikely event there is a conflict between an FEA rule under the utility program and a Federal Trade Commission rule of general applicability, the Federal Trade Commission rule will apply.

LANGUAGE:

Add the following new subsection 106(b):

"(b) Nothing in this Act shall be construed as restricting the jurisdiction of the Federal Trade Commission under any provision of law, including this Act, to prevent unfair methods of competition and unfair or deceptive acts or practices by public utilities in connection with utility programs under this Part, including jurisdiction to enforce all applicable Trade Regulation Rules issued under the Federal Trade Commission Act 15 U.S.C. §41 et. seq. and all applicable provisions of the Consumer Credit Protection Act, as amended, 15 U.S.C. § 1601 et. seq."

II. UTILITY PROGRAM

A. COMPETITIVE POSITION OF UTILITIES

PROBLEM:

The preeminent role of public utilities in the National Energy Act bill's program for retrofitting existing homes creates serious competitive problems. Utilities have established channels of contact, via servicing and billing, with almost every American home. Unless there is a maximum degree of competition at each level of the program, consumers may find that the utility monopoly, however well-regulated, has expanded to include the retrofitting business. The requirement that public utilities arrange for home appraisals, installation of energy-saving materials or devices, and financing of weatherizing costs may drive smaller businesses that lack the economic resources of utilities from the market. Independent businesses that do not sub-contract with utilities and lack similar access and exposure to consumers will be unable to compete effectively. The result may be increased concentration, a greater potential for development of oligopolies or monopolies in individual geographic regions, and related problems of overcharging for supplies, services, and capital. On the other hand, direct entry by utilities into the retrofit business in some markets may increase competition with existing businesses, large and small.

SOLUTION:

Public utilities should not be required to offer to install suggested energy-saving measures. Public utilities should be allowed to enter the supply and installation business, but only if sub-contractors are not utilized. If a utility elects to enter the supply and installation business, it should enter as a direct competitor of existing businesses, if competitive conditions make such entry feasible. Otherwise, utilities should stay out of the developing energy-conservation supply and installation field, allowing independent businesses to compete on equal footing.

Additional safeguards should be considered to assure that utilities entering the market directly do not take unfair advantage of their appraisal role. One such safeguard would be a requirement that utilities inform customers of all companies (possibly including themselves) willing to perform an initial inspection and appraisal of residential needs, supply and/or install conservation measures, or provide financing.*

SUGGESTED LANGUAGE:

The utility program should be revised as follows:

1. eliminate Section 103(a)(2)(B) and reletter subsections (C) and (D) as (B) and (C) respectively;

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* Proposals to address additional competitive problems by rulemaking appear in section III. C., infra.

2. revise Section 102(d)(4) by omitting "installation of residential energy conservation measures" and adding in its place "utility program described in section 103;"
3. omit from section 104(a) the words "providing for the installation of residential conservation measures in the homes of its residential customers;"
4. amend section 104(a)(1)(C) to read "the list of suppliers and contractors who can arrange for purchase and installation of such measures;"
5. delete section 104(a)(2) and renumber section 104(a)(3);
6. revise section 104(d) by substituting for "a substantial proportion" the words "as large a number" and adding after the word "building" the words "as would have occurred under a program which meets the requirements of section 103."

Utilities may be prohibited from entering the supply and installation business through sub-contractors by making the following revisions:

1. reletter section 103(b) as 103(c);
2. add a new section 103(b) with the following language:

"Any utility electing to supply and install residential energy conservation measures shall not sub-contract with any independent business or company to provide such services, except that by rule the FEA Administrator shall make provision for any utility which was party to a contract with a sub-contractor as of April 20, 1977, to continue to provide such services pursuant to that contract for the term of the contract, exclusive of any renewal provision, or one year, whichever is shorter."

3. delete from the first sentence of section 103(a) the words "(b) and" and change "subsections" to "subsection."

The following changes are recommended as safeguards to ensure that consumers receive information about competitors in the inspection, supply and installation businesses:

1. add to the end of Section 103(a)(1)(C) the phrase "and the inspectors, suppliers, and contractors described in paragraph (3) of this subsection;"
2. insert the words "and are willing to perform a residential inspection and give an estimate of costs" between the words "measure" and "which" in Section 103(a)(3).

B. CONSUMER CREDIT PROTECTION

PROBLEM:

The Consumer Credit Protection Act, 15 U.S.C. § 1601, et. seq. Public Law 90-321, as amended, contains seven separate titles establishing minimum federal protections for consumers (and in some cases businessmen) involved in credit transactions. The separate titles include the Truth in Lending Act with its Fair Credit Billing Amendments.

Section 104 of the Truth in Lending Act, 15 U.S.C. §1603, exempts certain transactions under public utility tariffs if the Federal Reserve Board determines that the state regulatory body regulates the charges involved. In the context of traditional utility activities this exemption is sensible since the Act's primary purposes -- to facilitate comparative shopping for credit and to foster price competition -- will not be served. In contrast, extensions of credit under utility programs should not be exempted since there are alternative sources of both the services to be performed and the financing that will be available. Compliance with the Truth in Lending Act will encourage consumer shopping and credit price competition. In addition, the Truth in Lending Act provides a three-day period during which a consumer may cancel a loan. This

provision may be important in home improvement transactions in which a security interest is taken in the principal residence of the consumer.

The Federal Trade Commission does not construe Section 104(4) of the Truth in Lending Act to authorize an exemption for extensions of credit by utilities for the purpose of home insulation or retrofitting. Some utilities currently sponsoring programs similar to the utility program required in the bill, however, have failed to comply with applicable consumer credit protection laws. Explicit clarification, therefore, is warranted.

The application of the Fair Credit Billing Act to utility programs which otherwise meet the Act's definition of "open end credit" also requires clarification. The Fair Credit Billing Act (15 U.S.C. § 1666-1666j) (Supp. IV, 1974)), provides a mandatory dispute resolution procedure for alleged billing errors appearing on periodic billing statements sent to consumers. Utility billing systems which meet the definition of "open end creditor" should be required to comply with the Fair Credit Billing Act dispute resolution procedures.

SOLUTION:

A provision clarifying the applicability of the Truth in Lending Act to extensions of credit by utilities under utility programs should be added to Section 106. It is

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anticipated that FEA in its rules applicable to residential energy conservation plans under Section 102, alternative plans under Section 104 and utility programs under Section 105 will provide guidelines for compliance with the Truth in Lending Act and the other titles of the Consumer Credit Protection Act.

LANGUAGE:

Add the following new subsection 106(c):

"(c) Nothing contained in §104(4) of the Truth in Lending Act, Public Law 90-321, as amended, 15 U.S.C. § 1603(4), or the regulations issued pursuant thereto shall be deemed to exempt sales or credit extensions by public utilities under § 103 of this Act."

C. FEDERAL ENERGY ADMINISTRATION RULEMAKING

PROBLEM:

Programs by state utility commissions to prevent "unfair, deceptive or anticompetitive acts or practices" under subsection 102(d)(2) will be greatly improved if the Administrator, as part of his rulemaking under Section 102, provides standards for such programs. The Federal Trade Commission, which has extensive experience in giving specific meaning to a similar statutory mandate, should be directly involved in the development of such standards. Further, the Administrator should promulgate rules designed to prevent unfair, deceptive or anticompetitive acts or practices in

the implementation of utility programs under Sections 102(e),* 104 and 105. There is a growing body of Federal Trade Commission Trade Regulation Rules which would apply to sales and financing under utility programs. Thus, it is important that the Administrator promulgate rules for these utility programs in close cooperation and coordination with the Federal Trade Commission.

SOLUTION:

Section 102 should be amended to require the FEA Administrator to include specific standards for the program required by subsection 102(d)(2), and to promulgate rules in cooperation and coordination with the FTC to prevent unfair, deceptive or anticompetitive acts or practices under Sections 102(e), 104 and 105.

The following are examples of acts or practices which should be proscribed by rule:

1. Termination of Utility Service for Nonpayment on Residential Energy Conservation Measures.

   Utility service termination could be an extremely coercive debt collection technique, because it might endanger the safety and health of the debtor. Where the debt to the public utility is a result of residential energy conservation measures purchased from or financed

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* The bill inadvertently contains two sections designated as 102(d). The second section so designated 102(d) will be referred to as 102(e) in this submission.

by the utility, termination should not be permitted for nonpayment. Other companies offering this service cannot employ this collection technique and the consumer would not expect service terminations to occur where the debt does not arise from that service. In addition, FEA standards should establish a uniform method of allocating consumer payments between utility services and energy conservation services.

2. Security interests.

One area of the home improvement business that has caused great concern to consumers and regulators in the past has been the practice of taking second mortgages to secure credit obligations arising from the improvements, and the application of state laws creating mechanics and materialmen's liens in the improvements and property in which they are made. Low income consumers have been threatened with loss of their homes for work not completed by the contractor. See Slaughter v. Jefferson Federal Savings, 361 F. Supp. 590 (D. D.C. 1973), rev'd, 538 F.2d 39 (D.C. Cir. 1976). A recent newspaper article details how a home was to be placed for sheriff's

sale even though the consumer had paid cash for the improvements. The contractor had employed subcontractors to perform the work, but left town with the consumer's cash. After the work was completed, the subcontractors obtained a lien against the consumer's home for the value of their work. Similar incidents in Southern California have led to licensing and bonding requirements in that state. The problem has been so serious that a separate section of the Truth in Lending Act, 15 U.S.C. § 1635, was created to deal with it. The statement of basis and purpose of the Federal Trade Commission's rule concerning the preservation of consumer claims and defenses also refers to this problem. 40 Fed. Reg. 53511 (Nov. 18, 1975).

Accordingly, no foreclosure should be permitted as a result of a mortgage on a consumer's principal residence arising from purchase of residential energy conservation measures under a utility program. The only alternative would seem to be a strict performance bonding requirement for contractors and/or a guarantee by utilities that perform the work directly.

3. Dispute Resolution Procedures.

The Fair Credit Billing Act on 1974 (15 U.S.C. § 1666-1666j(Supp. IV, 1974) includes a mandatory dispute resolution procedure designed to correct billing errors under "open end" credit accounts which are composed primarily of credit card and department store revolving charge accounts.

Utility billing systems may not meet the technical definition of open end creditor, however, and therefore will not be required to comply with the Fair Credit Billing Act's dispute resolution procedures. Therefore, the FEA guidelines should require a billing error dispute procedure identical to § 167 of the Fair Credit Billing Act for any amounts billed on the consumer's regular periodic utility bill for the purchase of residential energy conservation measures.

4. Acceleration Charges.

Where the utility program's credit transactions are traditional installment contracts, § 103(a)(2)(D) provides that "a lump sum payment of outstanding principal and interest may be required upon default in payment by the residential customer." This clause raises the question of whether a creditor is entitled to collect unearned finance charges on a precomputed loan, or whether recovery should be

limited to earned finance charges determined either at the time of default or at the time at which a judgment is obtained. The question should be resolved by an FEA rule limiting recovery to earned finance charges.

5. Public participation before state regulatory commissions

Some form of public participation in the formulation, implementation and policing of state residential energy conservation programs under Section 102 should be required by FEA rule. See Lefler & Rogol, "Consumer Participation in the Regulation of Public Utilities," 13 Harv. J. Legis. 235 (1976). The Federal Trade Commission has pioneered public participation on the federal level through its pilot program under the Federal Trade Commission Improvements Act, 15 U.S.C. § 58(h), PL 93-637, § 202(h).

Unless a state currently provides for public participation in its proceedings, FEA regulations should require that a program be implemented that would, at a minimum, apply to the formulation, implementation and policing of state residential conservation programs under Section 102. The Subcommittee, however, may consider amending Title I, Part E, of the bill to include consumer

participation provisions similar to those proposed in H.R. 6660, which should then be made applicable to regulatory proceedings involving utility programs.

6. Neutral Inspection.

As long as utilities are required to offer an appraisal and are also allowed to provide and install energy-saving measures, the potential for conflicts of interest and other abuses exists. FEA guidelines should require that the appraiser/inspector sent by a utility pursuant to section 103(a)(2)(A) neither recommend nor disparage any particular brand or company. Although enforcement may be difficult, the rules would help give independent supply and installation companies an equal opportunity to compete with a utility. They would also tend to discourage over-statement of consumers' needs by the inspector.

7. Cross-Subsidization.

Utilities should not be permitted to compete unfairly by underpricing supplies, services, or capital and recovering the difference through higher energy rates. Cross-subsidization can also occur if a utility shifts the cost of inspections to the rate base, thereby enabling it to

charge less for actual installation than an independent competitor who must absorb the cost of "free" inspections and estimates in his price. Accordingly, FEA guidelines should require strict cost-accounting and separate financial records for every utility's residential energy conservation program. The rules should specify that (1) any utility entering the supply and installation business is forbidden from passing the costs of that business to the rate-payers; and (2) all expenses of the utility's supply and installation business, including a proportionate share of overhead and administrative costs, must be allocated to that business.* The FEA rules

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* The issue of whether utilities should be required to offer a "free" inspection is not addressed in the bill. An argument can be made that utilities should be required to recover the cost of inspection by charging fees for the service. This would have the advantage of placing costs upon the party who benefits, rather than on all rate-payers. In addition, this would require utilities to compete on an equal basis with private inspection firms. The major drawback to this would be that some consumers might not obtain inspections if they are aware that a fee will be charged.

The Committee may wish to recommend a tax credit to reimburse homeowners for part of the cost of residential inspections. Alternatively, the cost of appraisals and estimates made in connection with the purchase and installation of energy-conserving devices could be considered to be part of the cost of such devices and eligible for any appropriate tax credit.

should authorize a utility to recover its inspection costs from the rate base only if the utility commits in its utility plan submitted to the FEA Administrator for approval that it does not and will not offer supply and installation services.

8. Lists of Suppliers and Contractors

FEA guidelines should establish strict but fair standards for utilities to follow in compiling and maintaining full and complete supplier and contractor lists as required by Section 103(a)(3). Although the bill does require that the list be "designed to encourage participation ...in a non-discriminatory manner," there is no additional requirement that the list be extensive or complete. The guidelines should assure that the lists contain the names of all qualified, bona fide companies, are updated periodically, and follow a random order or method of presentation.*

* The minimum standards that a contractor or inspector must meet to qualify for listing should be set by FEA. A utility should not pass judgment on a contractor's qualifications or bear responsibility for a listed contractor's failings. To avoid a complicated licensing process which could raise unnecessary barriers to entry into the conservation program, we would suggest that any contractor seeking to be listed by the utility must certify, under penalty of perjury, that it meets the standards. The utility would list any self-certified contractor requesting listing. Data to be included on the list should be determined by rule, with particular attention to the advisability of indicating which companies are bonded and which offer free inspections and estimates.

Consideration should be given to requiring an appeal process for companies that are excluded from the list under the standards to be enacted. Finally, if the bill is amended as proposed in Section II.A. supra to require utilities to inform their customers which companies are willing to perform residential inspections, then rules should be promulgated to create standards and procedures applicable to the compilation, maintenance, and revision of this portion of the list.

9. Overlapping Utility Service Areas

Where two utilities have overlapping service areas (for example where one utility provides gas for heating purposes and another provides electricity to the same residence), the utilities may attempt to join forces to offer the mandated services, or one utility may rely on the other to provide the services for that geographic area and relieve itself of the obligation of offering a full-fledged utility program. Specific rules should be promulgated to prevent joint efforts of this sort and to ensure the maximum degree of participation (and competition) by utilities.

10. Tying Arrangements

A utility that engages in the supply and installation business might attempt to link its provision of energy to customers to the supply and installation of particular energy-saving measures. FEA rules should prohibit such tie-in arrangements.

LANGUAGE:

The current subsection 102(b)(2) should be renumbered to (b)(3), and the following provision be inserted as subsection (b)(2):

> "(2) shall include standards for the program required by subsection (d)(2) and standards designed to prevent unfair, deceptive or anti-competitive acts or practices which affect commerce in the implementation of residential energy conservation programs under Section 102(e), alternative programs under Section 104 and utility programs under Section 105, which the Administrator shall develop in close cooperation and coordination with the Federal Trade Commission; and . . . ."

III. FTC RESPONSIBILITIES

A. RULEMAKING

PROBLEM:

Numerous potential consumer protection and anticompetitive problems can be anticipated to result from the massive programs contained in both Titles I and II of the National Energy Act bill. There are at least 70 million residential dwellings in the United States; 40 million of them could benefit from retrofit with energy saving devices. The timetable contained in the Act for retrofit of homes is very short; according to the national goals established in the bill, by 1985 insulation will be installed in 90 percent of all American homes and all new buildings, and solar energy will be used in more than two and a half million homes.

Elements of the home improvement industry in this country have often been a source of serious consumer abuses. Such problems may be exacerbated by the increased demand for home insulation and retrofitting spawned by the utility programs in Title I and the rebate provisions of Title II.

The Federal Trade Commission is the federal agency possessing the broadest responsibility for preventing unfair, deceptive and anticompetitive practices in the marketplace. If it is to adequately monitor the marketing practices associated

with the manufacture, sale and installation of energy savings devices, and enforce its general Section 5 authority under the Federal Trade Commission Act, the Commission will require significantly increased resources. Problem areas already identified by the Commission include the following:

1. Warranties and Consumer Remedies.

Warranty and consumer remedies for breach of warranty present particularly troublesome problems with respect to home insulation and other energy saving devices, including solar products. The absence of adequate or proven test and performance standards for solar equipment itself makes warranty and warranty enforcement particularly important to the consumer. With respect to insulating devices, it is often extremely expensive, if not impossible, to determine whether the product purchased meets the standards represented by either the seller or the manufacturer. Simple visual inspection of attic insulation, for example, often will not disclose improper installation and certainly will not tell a consumer whether he has received the "R-value" promised.

The National Bureau of Standards under contract with the FEA recently had installed three different types of insulation in a building at the NBS's

Center for Building Technology. It subsequently tested the building and found that all three installations resulted in significantly less "R-value" than represented by the manufacturer. The only method for determining the efficacy of installed insulation is through the use of "thermography." Thermography equipment costs approximately $45,000 to purchase. Where thermography service is available, it costs between $50 and $80.

The traditional problem of undercapitalization in the home repair industry is particularly severe in the solar heating and cooling industry, where many of the small, pioneering companies are undercapitalized. Solar equipment is expensive, representing a major investment by the homeowner. If it is improperly installed or defective, however, the equipment may also pose a risk of structural harm to the home. Indeed, an argument could be made based on this type of risk, for requiring that solar property be installed with a minimum performance bond if it is to qualify for a tax credit under Title II. Such a requirement, however, would raise serious barrier-to-entry questions, and might have an unduly stifling impact upon innovation in the nascent solar industry.

These problems of warranty and consumer remedies can best be addressed through the rulemaking process. Accordingly, the Commission should be directed to initiate rulemaking to address warranties and warranty practices in connection with the sale of retrofitting devices, including insulation, energy saving devices and solar property.

2. Product Claims.

A consumer must have truthful, relevant product information readily available in order to make intelligent purchase decisions. This information must be available in a form that is readily understandable. It must facilitate the comparison of energy savings values between both products and brands. Most consumers will be unable to purchase all the recommended energy savings devices for their homes. Their purchases, therefore, ought to result in the greatest energy savings for the dollar. This goal can be accomplished best if the products and those who market them utilize easily understood and comparable energy claims.

The Commission has authority to monitor energy savings claims and to take action on a case-by-case basis against those who make unfair, deceptive or false claims. The case-by-case approach, however,

is expensive, and can only stop the most blatant abuses. Accordingly, the Commission should be given authority to institute a rulemaking proceeding to establish requirements for the disclosure of energy savings information and claims with respect to energy savings devices and products.

3. Marketing and advertising claims.

The most difficult types of unfair and deceptive acts and practices to control are those that take place everyday in thousands of localities around the country. Yet, the home improvement industry is primarily composed of thousands of locally-based, small businesses. These businesses advertise in local papers and on local media, or solicit business through the local mail or door-to-door. If the FTC is to monitor much of this activity, it will require substantial additional resources.

Again, the most efficacious approach to preventing unfair and deceptive acts or practices in the marketing, advertising and installation of energy savings devices and solar energy property is through the rulemaking process. Accordingly, the Commission should be directed to initiate a rulemaking proceeding with respect to energy savings information and claims and unfair methods of competition or unfair

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or deceptive acts or practices by those who market, advertise and install energy saving devices and solar energy property, and to require such other disclosures as are necessary to aid consumers in preserving scarce fuel supplies.

4. Expedited Rulemaking

At present, the Federal Trade Commission is authorized to promulgate Trade Regulation Rules under Section 18 of the FTC Act, 15 U.S.C. § 58.* Section 18 contains a broad grant of authority for the Federal Trade Commission to prescribe rules (commonly known as "Trade Regulation Rules") which "define with specificity

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* Section 18 was added to the FTC Act in 1975 by Title II, Section 202 of the Magnuson-Moss Warranty -- Federal Trade Commission Improvement Act, Pub. L. No. 93-637 (January 4, 1975).

The Federal Trade Commission also has inherent authority to promulgate rules under section 6(g) of the Federal Trade Commission Act to interpret and enforce the prohibitions contained in Section 5 of the Act. See National Petroleum Refiners Association v. FTC, 482 F.2d 672 (D.C. Cir. 1973).

acts or practices in or affecting commerce" and further states that such rules may "include requirements prescribed for the purpose of preventing such acts or practices." When a rule becomes effective, a subsequent violation constitutes an unfair or deceptive act or practice in violation of Section 5(a)(1) of the FTC Act.

However, from 1975 to the present the median elapsed time from publication of the initial notice of proposed rulemaking pursuant to Section 18 to the Commission's consideration of whether to promulgate a final rule is currently estimated to be 31 months.* Thus, rules to protect against unfair, deceptive and anticompetitive acts or practices related to the marketing of energy saving components, if promulgated under Section 18 of the Federal Trade Commission Improvements Act, will become effective only after many of the purchases prompted by the National Energy Act bill are completed. Under the utility program in Title I, for example, utilities are required to have contacted all of their customers by January 1, 1980. Under Title II, tax rebates and credits are made retroactive to April 20, 1977, and decline over time to encourage early purchase. Accordingly, the Commission should be required to use expedited rulemaking procedures under 5 U.S.C. §553 in promulgating the rules previously discussed.

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* By way of comparison, pursuant to Title I of the Magnuson-Moss Warranty -- Federal Trade Commission Improvement Act, the Commission has promulgated three "warranty" rules implementing provisions of Title I. These rulemaking proceedings were conducted under 5 U.S.C. §553 with the additional requirement that oral presentations be allowed. All three rules were promulgated within six months of the notice of proposed rulemaking and required an average of two-thirds of an FTC attorney workyear per rule.

The possibility of civil penalties under Section 5(m)(1)(A) of the FTC Act and "consumer redress" under Section 19 of the FTC Act has been a significant factor in gaining compliance with FTC Trade Regulation Rules. For the Commission's rules on energy to be effective law enforcement tools, the Commission must also be able to sue rule violators for civil penalties and "consumer redress." Moreover, the availability of a consumer redress remedy for violations of energy-related rules could prove to be the only effective means of resolving the difficult warranty and consumer remedy problems discussed above. Accordingly, violations of the rules promulgated by the Commission under the National Energy Act should be subject to civil penalties and consumer redress as if they were violations under Sections 5(m)(1)(A) or 19 of the FTC Act.

SOLUTION:

Add a new Subpart 4 to Title I, Part A.

LANGUAGE:

"Subpart 4 -- Federal Trade Commission Sec. 140:
(A) The Federal Trade Commission shall initiate a rulemaking proceeding dealing with:

(1) requirements applicable to manufacturers of building insulation, solar energy heating or cooling property and other energy conservation devices, products or systems, with respect to disclosure of energy use and savings information or claims;

(2) requirements applicable to any person marketing, advertising or installing building insulation, solar energy heating or cooling property and other energy conservation devices, products or systems, with respect to disclosure of energy use and savings information or claims;

(3) any other requirements necessary to prevent unfair methods of competition and unfair or deceptive acts or practices under Section 5(a)(1) of the Federal Trade Commission Act in the manufacture, marketing, advertising, distribution and installation of building insulation, solar energy heating or cooling property and other energy conservation devices, products or systems; or such other disclosures as may be necessary to aid consumers in preserving scarce fuel supplies.

B. The Federal Trade Commission shall initiate a rulemaking proceeding dealing with warranties and warranty practices in connection with the sale and installation of building insulation, solar energy heating or cooling property and other energy conservation devices, products or systems; and, to the extent necessary to supplement protections offered the consumer by any other provision of law, shall prescribe rules dealing with such warranties and practices. In prescribing rules under this paragraph, the Commission may exercise any authority it may have under other laws, and in addition, it may require:

(1) disclosure that such items are sold without any warranty and specify the form and content of such disclosure;

(2) a written warranty as to the insulation value and proper installation of such items;

(3) establishment of informal dispute settlement mechanisms.

C. The Federal Trade Commission shall prescribe the rules required by paragraphs (A) and (B) in accordance with Section 109(a) of the Magnuson-Moss Warranty--Federal Trade Commission Improvement Act, 15 U.S.C. 2309, except that Section 18(e)(3)(A) of such Act shall not apply to judicial review under Section 18(e).

D. In prescribing rules under paragraphs (A) and (B), the Federal Trade Commission shall consider --

(1) the National Energy Goals contained in Section 3 of the Act,

(2) the need to reduce unnecessary consumer costs resulting from ineffective or inefficient insulation, solar energy heating or cooling property and other energy conservation devices, products or systems,

(3) ease of administration and enforcement, and

(4) industry practices.

E. (1) The Federal Trade Commission shall have procedural, investigative, and enforcement powers, including the power to issue procedural rules in enforcing compliance with the rules prescribed pursuant to the requirements of this Subsection, and to require the filing of reports, the production of documents and physical evidence, and the appearance of witnesses, as though the applicable terms and conditions of the Federal Trade Commission Act were part of this Subsection.

(2) A substantive amendment to, or appeal of, a rule promulgated under paragraphs (A) and (B) shall be prescribed, and subject to judicial review, in the same manner as a rule prescribed under such paragraph.

F. (1) When any rule prescribed under paragraphs (A), (B), and (E) takes effect, a subsequent violation thereof shall constitute an unfair or deceptive act or practice in violation of Section 5(a)(1) of the Federal Trade Commission Act, unless the Federal Trade Commission otherwise expressly provides in such rule.

(2) For the purposes of Section 5(m)(1) and Section 19 of the Federal Trade Commission Act, rules prescribed under paragraphs (A), (B) or (E) shall be deemed "rules under this Act respecting unfair or deceptive acts or practices."

B. PRODUCT STANDARDS

PROBLEM:

Privately developed product and material standards applicable to energy saving devices and solar energy property will play a major role in the implementation of

the National Energy Act bill.* Yet these privately developed standards have the potential to restrain trade, deceive consumers or to expose them to health and safety hazards. Unduly restrictive standards may exclude valuable energy saving devices from the marketplace. Consumers may be deceived by industry "seals of approval," if the standards relied upon for such approval are inadequate to establish claimed energy saving potentials. Private standards may also tend to freeze the state of the art around existing energy conservation products and materials stifling in innovation.

The Federal Trade Commission staff is currently investigating privately developed standards and standard setting mechanisms. In his testimony before this Subcommittee on March 3, 1977, Chairman Collier described this investigation and the Commission's concerns about the

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* Numerous provisions in the bill relate to product or material standards. Under Sec. 1101 of Title II, the Secretary of Treasury must define the term "insulation," to identify in regulations "solar energy property" and to determine, upon request of the Administrator of FEA, what other "devices or measures" should qualify for a tax credit. Under Section 102, of Title I, the Administrator of FEA is authorized to establish "standards for general safety and effectiveness of any suggested [conservation] measure" and "for installation of any residential energy conservation measure."

antitrust and consumer protection implications of privately developed standards. One of these concerns is the degree to which government agencies rely upon privately developed standards, occasionally adopting them as government standards.

The extremely tight time limitations imposed by the National Energy Act bill for promulgation of utility programs, tax rebate rules and other programs virtually assures that the Administrator of FEA and the Secretary of the Treasury must rely upon private industry standards in implementing the Act. Though many, perhaps most, of the privately developed standards will be suitable for use in implementing the Act, there is, as indicated above, significant potential for abuse. The Federal Trade Commission has developed valuable expertise in evaluating potential anticompetitive and consumer protection impacts of privately developed standards. If consulted by the FEA Administrator or the Secretary of the Treasury, the Federal Trade Commission could point out potential adverse impacts of specific standards, and recommend methods of either avoiding those impacts or disclosing them to consumers.

SOLUTION:

The Administrator of FEA and the Secretary of the Treasury should consult with the Federal Trade Commission with regard to any product or material standard that is relied on in implementing the Act.

LANGUAGE:

Add a new subsection 141 to the proposed new Subpart 4, as follows.

> "Sec. 141: The Secretary of Treasury and the Administrator of FEA shall consult with the Federal Trade Commission with regard to any product or material standard which is relied on in implementing this Act as a basis for judging the efficacy, energy efficiency, safety or other attributes of energy conservation materials, products or devices, for the purpose of insuring that such standards do not operate to deceive consumers or unreasonably restrict consumer or producer options, and that such standards (where applicable) are suitable as a basis for making truthful and reliable disclosures to consumers regarding performance and safety attributes of energy conservation products, materials and devices."

C. INCREASED AUTHORIZATIONS

PROBLEM:

In order to undertake the additional responsibilities imposed under the National Energy Act bill, the Federal Trade Commission will require substantially increased budgetary authority.

SOLUTION:

Authorize appropriations to the Federal Trade Commission to carry out its responsibilities under the National Energy Act.

LANGUAGE:

Add a new section 142 to the proposed new subpart 4, as follows:

"Sec. 142: There are hereby authorized to be appropriated to the Federal Trade Commission such sums as may be necessary to carry out its responsibilities under this subpart."

IV. OTHER PROGRAMS

A. AUTOMOBILE DISCLOSURES

PROBLEM:

Section 222 of the bill authorizes the Commission to prescribe rules requiring that the amount of any tax or tax rebate under the Act be disclosed in advertisements which: (1) state the price or fuel economy of any automobile or (2) feature an identifiable model. As presently drafted, however, this provision applies only to "televised" advertisements, and advertisements in writing. Moreover, the purpose of the National Energy Act would be furthered if the FTC were authorized to require that certain additional facts related to automobile efficiency be disclosed in any advertisement.

SOLUTION:

The FTC should be authorized to promulgate rules requiring the following additional disclosures:

1. Standard Fuel Economy Information.

Disclosure of EPA mileage ratings in all advertisements would require consumers to consider not only the advertised model's cost of acquisition, but also the cost of ownership.

2. Octane Ratings.

Disclosure of octane ratings at point-of-sale and also in owner's manuals would enable consumers to avoid purchasing gasoline with excessive octane levels.* More crude oil is required to produce high octane gasoline than to produce relatively lower octane gasoline. Thus, octane "overbuying" causes a substantial waste of energy reserves which should, if possible, be eliminated.

3. Recommended Maintenance and Use.

Many new car purchasers may not appreciate the extent to which patterns of automobile use (e.g. choice of length and frequency of trips, shopping, social activities) and maintenance affect fuel economy. Disclosure in owners' manuals of recommended maintenance and use would enable consumers better to conserve fuel.

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* The House this session overwhelmingly approved H.R. 130, Title II of which mandates octane posting on dispensing pumps and requires the Commission to develop rules for disclosure of a car's octane needs in its owner's manual. A similar bill, S. 18, has been introduced in the Senate.

LANGUAGE:

Strike Section 222(a). Insert in lieu thereof the following:

"Section 222: (a) The Federal Trade Commission is authorized to prescribe rules requiring disclosure --

(1) in any advertisement whether in print, broadcast or point-of-sale, with respect to any identifiable new automobile model that makes any representation, express or implied, with respect to fuel consumption, cost of acquisition or operation:

(a) the applicable fuel economy rating for each such model which is required to be disclosed by the manufacturer or importer pursuant to section 506 (a) of the Motor Vehicle Cost Savings Act, as amended; and

(b) the tax imposed under Section 4064 of the Internal Revenue Code of 1954 or rebate payable under Section 6429 of such code.

(2) in the owner's manual of every new automobile beginning with FY 1979:

(a) the octane rating of such new automobile;

(b) information to assist the owner in saving fuel by

i. improved driving techniques

ii. improved trip selection, and

iii. proper self-maintenance procedures

B. ENERGY EFFICIENCY STANDARDS FOR CONSUMER PRODUCTS OTHER THAN AUTOMOBILES

PROBLEM:

Section 201(a) of the bill would amend Section 325(a) of the Energy Policy and Conservation Act (EPCA) of 1975 to require the Administrator of the Federal Energy Administration to prescribe by rule energy efficiency standards for certain types of consumer products, such as freezers, water heaters, and room air conditioners. The Administrator would also have the option under this section to establish by rule such standards for other types of products, including, inter alia, dishwashers, clothes dryers, and television sets.

The Administrator may prescribe standards only in those instances where the standards would be, inter alia, economically justified. Similarly, the standards themselves must be ". . . designed to achieve the maximum improvement in energy efficiency which the Administrator determines is . . . economically justified . . . . "

In determining whether an energy efficiency standard is economically justified, the Administrator must consider the economic impact and any negative effects on competition

likely to result from the imposition of the standard. The economic and competitive impacts of an energy efficiency standard are important factors in determining whether such a standard is economically justified. For example, unreasonably high standards might be too expensive for small firms to meet, and also could act as a barrier to entry into the market by new firms. The Commission can provide valuable advice to the Administrator regarding these impacts.

SOLUTION:

The Administrator should consult with the Federal Trade Commission.

SUGGESTED LANGUAGE:

Add a new Paragraph (6) to Section 201(a), Part B, Title 1, which reads:

> "(6) In determining the economic impact of the standard pursuant to paragraph (5)(A) and in determining any negative effects on competition likely to result from the imposition of the standard pursuant to paragraph (5)(E), the Administrator shall consult with the Federal Trade Commission."

Renumber remaining paragraphs accordingly.

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C. FEDERAL INITIATIVES

PROBLEM:

Section 721 of the National Energy Act bill authorizes funding for development of existing federal retrofitting and conservation programs, and Sections 741 to 746 establish and authorize funding for a new program to encourage the demonstration and use of solar heating and cooling devices in federal buildings. The funds authorized under both plans will allow the federal agencies to use the money internally to develop proposals and to contract out the research, development and installation of these energy-related measures. Since a substantial portion of the funding will probably be used for independent contractors, the government should take care that all available money does not go only to large, established firms or businesses.

SOLUTION:

A provision should be inserted in the bill to ensure that small businesses receive a fair share of the contract and contract funds for research, development, manufacture and installation of solar heating and cooling devices and other energy-related measures.

SUGGESTED LANGUAGE:

Add the following as new subsection (g) in Section 721 of the bill, and as a new subsection (b) to Section 746:

"Each agency entering into contracts to develop or complete the plans or projects authorized by this subpart shall ensure that small business concerns are given a full and fair opportunity to compete for and enter into such contracts with each agency, in accordance with applicable Federal Procurement Regulations."

D. ENERGY CONSERVATION PROGRAM FOR SCHOOLS AND HOSPITALS

PROBLEM:

Section 301 of the bill would add several new sections (Sections 303-309, 391) to the Energy Policy and Conservation Act (EPCA) of 1975. The new EPCA Section 303 authorizes the Administrator of the Federal Energy Administration to make grants to the states which would be used as partial financing for certain specified energy conservation projects for public and nonprofit schools and hospitals.

States must formulate and submit for FEA approval plans describing their proposed energy conservation program for public and nonprofit school and hospital grants. Although the Adminsitrator appears to have the authority to prescribe any guidelines for state plans that he deems necessary, he is specifically directed to prescribe only guidelines indicating the types of energy conservation measures appropriate for each region of the country.

SOLUTION:

The Administrator should be required to promulgate guidelines designed to ensure that the states spend the grant monies in a manner likely to promote competition and to afford small businesses a full and fair opportunity to participate.

The Administrator should also be required to consult with the Federal Trade Commission prior to promulgating rules designed to ensure that the states spend the grants they receive in a manner likely to promote competition. The Commission and its staff could provide valuable input to the Adminstrator in the formulation of such guidelines.

LANGUAGE:

In proposed Section 304(a) of the EPCA (Section 301 of the bill), insert the words "and guidelines designed to ensure that state plans contain measures designed to promote competition, which were prescribed after consultation with the Federal Trade Commission." between the words "nation" and "The". In proposed Section 304(a) of the EPCA, also delete the "." after "nation".

Attachment B.—Home Insulation Industry

Response to request for information concerning the effect of increased demand within a relatively short period of time on the fiberglass home insulation industry.*

Background

The fiberglass home insulation industry, which accounts for approximately 80% of home insulation, is a highly concentrated industry, composed of three firms. These firms, Owens-Corning Fiberglas, Johns-Manville, and Certain-teed, have national domestic market shares of approximately 50%, 25%, and 25%, respectively. In addition, due to the high cost of transporting insulating materials, there may be a series of regional markets whose structure may be different from the national market.

Evidence necessary to evaluate the competitive conduct and performance of this industry is not available at this time. The rate of return for the three firms has been only average or below average for the last 15 years. However, this rate of return is not necessarily reflective of the fiberglass home insulation product line.

There are severe barriers to entry into the fiberglass home insulation industry. These barriers consist of cost, competitive technology and technical know-how. Although existing patents for the basic processes have expired the three fiberglass home insulation manufacturers currently hold new patents which have significantly

* This response was prepared on the basis of a brief, informal staff survey. It should not be construed to state an official position of the Federal Trade Commission or any individual Commissioner.

increased the efficiency of the manufacturing process. Without access to this new technology, a new entrant cannot economically compete. It has been estimated by an official of a large home-building products manufacturer which has shown some interest in entering the industry that it would take about 10 years and an investment of approximately $80 million at today's cost for his company to develop the needed technology and enter the industry with one plant.

Technical know-how is also extremely important. Even if a firm were to acquire the needed cost competitive technology it could not operate competitively without the technical know-how to design and operate a plant as an efficient economic process. It has been estimated by the same home-building products manufacturer that if his company were able to obtain licensing for the needed cost competitive technology and technical know-how, it could enter into the fiberglass home insulation industry with one plant in 2 to 3 years at a cost of $30 to $50 million. While it is likely that most large firms would enter with more than one plant, a single plant could have a significant impact in a regional market.

At least four home-building products manufacturers, two of which have well-known national distribution systems, have expressed an interest in entering the fiberglass insulation industry. Capital for these four companies

does not appear to be a barrier. But entry without licensing of the cost competitive technology and without access to technical know-how is considered by these firms as infeasible. Consequently, attempts have been made to acquire the needed patent licensing and technical know-how. The three existing fiberglass manufacturers have been reluctant to enter into such agreements.

It is not known whether the three existing manufacturers have excess capacity. Johns-Manville has recently announced plans to double its capacity and Certain-teed is in the process of bringing a new plant into operation. The expansion plans of Owens-Corning Fiberglas and the further expansion plans of Certain-teed are not known.

Other insulating materials such as rock wool, macerated paper and foam plastics like polyurethane do not appear to be competitive substitutes for fiberglass as a home insulating material. Rock wool has lower insulating value and, consequently, requires more product to meet insulating needs. Rock wool has been on the decline and is projected by Predicasts, Inc., in its Special Study of Glass and Other Advanced Fibers, February 22, 1973, to account for only 2.0% of the structural insulation materials market (both commercial and residential) by 1985. Moreover, existing rock wool manufacturers for the most part are single plant operations currently operating at 100% capacity and lacking the capital needed to expand capacity.

Macerated paper is not a viable substitute due to its inherent flammability.

Polyurethane cannot be considered a competitive substitute at this time because of the vast price differential between it and fiberglass. Although it has superior insulating quality, it is approximately three times more expensive than fiberglass. Moreover, since polyurethane is highly toxic when burned, its use as a home insulating material may be limited.

Imports are not competitive with domestic manufacturers because of the relatively high cost of transporting such a bulky, light-weight product. Domestic prices would have to rise very substantially before imports could be competitive.

Effect of short-term increased demand

The obvious effect of a sudden upward shift in demand will be higher prices for fiberglass home insulation. The effect which other insulating materials such as rock wool and polyurethane will have on the market will be minimal. There may be short-term shortages of fiberglass material to meet the energy conservation plan.

The increase in demand for fiberglass home insulation materials will have to be met by the three existing manufacturers unless the technology and technical know-how are made available to potential entrants. Since the level of augmented demand is expected to last only through 1985 (when the proposed tax credit terminates), new entrants

without access to the technology and technical know-how will not affect the energy conservation plan. However, if potential entrants are able to acquire licensing of the technology and technical know-how, de novo entry can be accomplished within 2 to 3 years. New entry, or perhaps even the threat of new entry, could be expected to result in increased competition, additional needed supplies, and lower prices to consumers.*

Staff preliminary investigation of home insulation industry

These preliminary comments were prepared on short notice without benefit of an industry-wide investigation. Since the impact of legislatively fostered increased demand on the home insulation industry is of significant public interest, the Bureau of Competition is undertaking further analysis of the issues raised here, and may recommend specific legislation to facilitate new entry and the availabiltiy of adequate capacity at competitive prices.

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* In addition to the questions for which information is provided hereinabove, Congressman Brown asked (1) whether there are other comparable examples of industries which have received sudden, short-term boosts of demand, and (2) whether the short-term nature of the demand increase will discourage de novo entry. We have not been able to identify useful parallels, and are unable to predict the effect of the short time period, per se, on entry.

Senator JOHNSTON. The Honorable T. P. O'Neill III, Lieutenant Governor of Massachusetts will be our next witness.

We want to welcome you to this committee again.

STATEMENT OF HON. THOMAS P. O'NEILL III, LIEUTENANT GOVERNOR, COMMONWEALTH OF MASSACHUSETTS

Mr. O'NEILL. Thank you, Mr. Chairman and members of the committee. I would like to thank you for the opportunity to testify in support of the President's energy conservation program.

We in Massachusetts have some changes to suggest to you. I want to highlight the fact we do this in a cooperative spirit. Massachusetts, we think, is convinced that energy saving is our best immediate energy option and we advocate conservation wherever possible.

With the help of funds appropriated by Congress, we have been able to act on that conviction. In 1976, we received one of two pilot grants awarded nationwide to run Project Conserve. Under this program questionnaires were mailed to all 925,000 homeowners in the commonwealth offering a computer analysis of potential energy savings in the home.

A recent poll conducted in Massachusetts showed that 45 percent of the homeowners who recalled the program were motivated by it to make energy conservation improvements in their homes.

This year, Massachusetts was the first State in the country to qualify for Federal funding through the FEA for its State energy conservation plan. We take energy conservation very seriously in Massachusetts, and I believe that the President's proposals, with certain important amendments, can enhance and expand our existing energy work enormously.

We believe that some changes are necessary to improve the usefulness of the utility energy conservation program, for our State and for others relying heavily on oil. Seventy percent of our homes in Massachusetts are heated by oil and serviced by hundreds of independent oil dealers. Yet these dealers will not play a significant role in the utility program as the legislation now reads.

Rather than delegate the responsibility for the entire program to the public utility commissions, we suggest that you authorize the Governors of each State to choose which agency or agencies should administer the residential energy conservation program.

The Governor will then have the flexibility, for example, to direct his regulatory commission to draft a plan for the utilities, and also to give his energy office the task of creating a parallel program with the oil dealers. I see no problem in mandating that the plan submitted by the Governors contain a public utility regulated utility program.

But this should be part of a total State plan, not the entire plan. Congress has already mandated two State energy conservation plans and a State-run, low-income weatherization program. It is essential now that you give the Governors the ability to mesh these programs with new programs now being proposed by the President, to eliminate duplication of effort and to address the unique problems of each State adequately.

We advocate changing the original definition of residential building. We prefer the definition, recently adopted by the House Subcom-

mittee on Power and Energy, which includes the double and triple deckers constituting a large part of our urban housing stock. These units would be excluded by the original definition in the President's bill. I add parenthetically that I think it was an oversight.

Third: We urge that this legislation be amended to require the Federal Energy Administration to write product quality and installation requirements for insulation, particularly sidewall insulation. We have received a number of complaints already concerning the lack of a clear definition of what constitutes insulation.

Other consumers have complained about the lack of standards to control insulation quality or to protect people from fraudulent installers. If our efforts to encourage energy conservation are not to be punctuated with cries of consumer ripoff, we must address these problems now.

As for the financing program, part (A) (2) of the energy plan, we question whether the creation of a secondary market for home improvement loans will make those loans more available or make them available at reduced rates. This problem is especially serious in urban States such as Massachusetts.

Low-interest loans or federally mandated incentives for banks to give low-interest loans are vital to help homeowners who may have too much income to qualify for weatherization assistance, but who still have insufficient income to benefit from tax credits.

We support the use of standards rather than targets for energy efficiency in new appliances. Legislation on this subject has been stalled at the State level, pending congressional action. Therefore, I urge your prompt attention to this important issue.

Senator METZENBAUM. Would you explain that?

Mr. O'NEILL. We liken it to the automobile emission program set aside by the Congress in past years. Rather than set target dates which were never in fact met, perhaps set a few standards—the goal could be more easily obtained.

Senator METZENBAUM. Are you saying on a mandatory basis?

Mr. O'NEILL. On a mandatory basis, that is correct.

Massachusetts continues to support the FEA weatherization program. The regulations for this program, recently released by the FEA, responded to our desire to include public housing in this valuable effort. We are still concerned, however, about our ability to pay labor costs for installing the weatherization material. But we have received assurances from the FEA that arrangements are now being worked out with the Department of Labor, to insure that this problem is resolved.

The schools and hospitals program is especially good news for a State such as Massachusetts, internationally famous for both our schools and our hospitals. We have over 2,400 municipal buildings in our State and 70 percent of our municipal energy budgets go for school buildings at the local level.

Obviously, school buildings are a dominant consumer of energy among public structures in our State. As for hospitals, they number around 225, and they spent $70 million in 1975, simply for energy costs. We firmly support an aid program directed at these facilities.

Moreover, we urge you to extend the definition of health care facilities. Massachusetts also has more than 100 nonprofit nursing homes, and they are an important part of our total health care system. The costs of the program will obviously rise as the definition of eligible

facilities is expanded, so I recommend that you increase the authorized appropriation for this program by $25 million.

Further, the funding ratio for the hospitals and schools in this program could be made more flexible to allow institutions in poorer areas to receive more Federal aid. We support the flexibility now in the bill, giving the States sufficient funding to administer the program, but given our past problems with the Office of Management and Budget, we urge you to consider including language insuring that at least some administrative funding will be released to the States.

We vigorously support the Federal demonstration program for solar heating and cooling in Federal buildings. Massachusetts has been an advocate of solar energy for some time now and we have learned a great deal about how Government can best help advance this technology.

The thrust of this program must be to demonstrate that well-constructed solar energy systems already offer long-term savings to the Government and the taxpayer, not to demonstrate that some exotic solar technologies actually can function. Otherwise the fallacy that solar equipment is not practical in any application today may well be perpetuated by the Federal building demonstration program.

While I have this opportunity to speak to your committee on the subject of energy conservation programs, I would like to point out a potential problem in the future regarding two existing energy conservation programs.

The Energy Policy and Conservation Act, EPCA, is authorized for $50 million a year through 1979. The Energy Conservation and Production Act, ECPA, is authorized for $40 million a year through 1979.

Yet the target set by Congress for these State energy conservation programs is a 5-percent reduction in project energy use by 1980. These programs, unfortunately, got off to a very slow start. Without an authorization through 1980, many States may be unable to accomplish the excellent energy conservation goals they have detailed in their plans.

I suggest that as part of this legislation the EPCA and ECPA program authorizations be merged, at an appropriation level of $100 million through 1980. This slight increase in funding levels is designed to take inflation into account.

In closing, I would like to stress that we are very pleased with the basic goals and directions of the President's energy program. The changes we have recommended are intended to strengthen that program in order that we can more smoothly and effectively meet those goals. I thank you for your time and attention.

Senator JOHNSTON. Thank you very much. I would like to go ahead with the whole panel before we get to the questioning so we can be sure to give everyone time.

[The prepared statement of Lieutenant Governor O'Neill follows:]

STATEMENT OF HON. THOMAS P. O'NEILL III, LIEUTENANT GOVERNOR, COMMONWEALTH OF MASSACHUSETTS

Mr. Chairman, I welcome this opportuntiy to testify in support of the President's energy conservation program, as detailed in the National Energy Plan. We in Massachusetts have some changes to suggest, offered in a cooperative spirit, which we feel will help strengthen the plan. But I stress: we have no quarrel at all with the philosophy and goals of the President's proposals.

Massachusetts is convinced that energy saving is our best immediate energy option, and we advocate conservation wherever possible. With the help of funds appropriated by Congress, we have been able to act on that conviction. In 1976, we received one of two pilot grants awarded nationwide, to run Project Conserve. Under this program, questionnaires were mailed to all 925,000 homeowners in the Commonwealth, offering a computer analysis of potential energy savings in the home. A recent poll conducted in Massachusetts showed that 45% of the homeowners who recalled the program were motivated by it to make energy conservation improvements in their homes.

This year, Massachusetts was the first state in the country to qualify for federal funding, through the FEA, for its state energy conservation plan. We take energy very seriously in Massachusetts, and I believe that the President's proposals, with certain important amendments, can change and expand our existing energy work enormously.

UTILITY/INSULATION PROGRAM

We believe that some changes are necessary to improve the usefulness of the utility energy conservation program, for our state and for others relying heavily on oil. Seventy percent of our homes in Massachusetts are heated by oil, and serviced by hundreds of independent oil dealers. Yet these dealers will not play a significant role in the utility program, as the legislation now reads.

Rather than delegate the responsibility for the entire program to the Public Utility Commissions, we suggest that you authorize the Governors of each state to choose which agency or agencies should administer the residential energy conservation program. The Governor will then have the flexibility, for example, to direct his regulatory commission to draft a plan for the utilities, and also to give his energy office the task of creating a parallel program with the oil dealers. I see no problem in mandating that the plan submitted by the Governor contain a Public Utility-regulated utility program. But this should be part of a total state plan, not the entire plan. Congress has already mandated two state energy conservation plans, and a state-run low income weatherization program. It is essential now that you give the Governors the ability to mesh these programs with new programs, now being proposed by the President, to eliminate duplication of effort and to address the unique problems of each state adequately.

DEFINITION OF RESIDENTIAL BUILDINGS

We advocate changing the original definition of "residential building". We prefer the definition, recently adopted by the House Sub-Committee on Energy and Power, which includes the double and triple deckers constituting a large part of our urban house stock. These units would be excluded by the original definition in the President's bill.

QUALITY CONTROL/CONSUMER PROTECTION FOR INSULATION

Third, we urge that this legislation be amended to require the Federal Energy Administration to write product quality and installation requirements for insulation—particularly sidewall insulation. We have received a number of complaints already, concerning the lack of a clear definition of what constitutes insulation. Other consumers have complained about the lack of standards to control insulation quality, or to protect people from fraudulent installers. If our efforts to encourage energy conservation are not to be punctuated with cries of "consumer rip-off", we must address these problems now.

FINANCING

As for the financing program (Part A, 2 of the Energy Plan) we question whether the creation of a secondary market for home improvement loans will make these loans more available, or make them available at reduced rates. This problem is especially serious in urban states such as Massachusetts. Low interest loans, or federally mandated incentives for banks to give low interest loans, are vital to help homeowners who may have too much income to qualify for weatherization assistance, but who still have insufficient income to benefit from tax credits.

APPLIANCES

We support the use of standards, rather than targets, for energy efficiency in new appliances. Legislation on this subject has been stalled at the state level, pending Congressional action. Therefore I urge your prompt attention to this important issue.

WEATHERIZATION PROGRAM

Massachusetts continues to support the FEA weatherization program. The regulations for this program, recently released by the FEA, responded to our desire to include public housing in this valuable effort. We are still concerned, however, about our ability to pay labor costs for installing the weatherization material. But we have received assurances from the FEA that arrangements are now being worked out with the Department of Labor, to ensure that this problem is resolved.

SCHOOLS AND HOSPITALS

The Schools and Hospitals Program is especially good news for a state such as Massachusetts, internationally famous for both our schools and our hospitals. We have over 2,400 municipal buildings in our state. And 70% of our municipal energy budgets goes for school buildings at the local level.

Obviously, school buildings are a dominant consumer of energy among public structures in our state. As for hospitals, they number around 225, and they spent $70 million in 1975 simply for energy costs. We firmly support an aid program directed at these facilities.

Moreover, we urge you to extend the definition of health care facilities. Massachusetts also has more than one hundred non-profit nursing homes, and they are an important part of our total health care system. The costs of the program will obviously rise as the definition of eligible facilities is expanded, so I recommend that you increase the authorized appropriation for this program by $25 million.

Further, the funding ratio for the hospitals and schools in this program could be made more flexible, to allow institutions in poorer areas to receive more federal aid. We support the flexibility now in the bill, giving the states sufficient funding to administer the program. But, given our past problems with the Office of Management and Budget, we urge you to consider including language insuring that at least some administrative funding will be released to the states.

SOLAR DEMONSTRATION PROGRAM

We vigorously support the federal demonstration program for solar heating and cooling in federal buildings. Massachusetts has been an advocate of solar energy for some time now, and we have learned a great deal about how government can best help advance this technology. The thrust of this program must be to demonstrate that well constructed solar energy systems already offer long term savings to the government and the tax payer, not to demonstrate that some exotic solar terhnologies actually can function. Otherwise, the fallacy that solar equipment is not practical in any application today may well be perpetuated by the federal building demonstration program.

STATE CONSERVATION PROGRAMS

While I have this opportunity to speak to your committee on the subject of energy conservation programs, I would like to point out a potential problem in the future, regarding two existing energy conservation programs.

The Energy Policy and Conservation Act (EPCA) is authorized for $50 million a year through 1978. The Energy Conservation and Production Act (ECPA) is authorized for $40 million a year through 1979.

Yet, the target set by Congress for these state energy conservation programs is a 5% reduction in projected energy use by 1980. These programs, unfortunately, got off to a very slow start. Without an authorization through 1980, many states may be unable to accomplish the excellent energy conservation goals they have detailed in their plans. I suggest that, as part of this legislation, the EPCA and the ECPA program authorizations be merged, at an appropriation level of $100 million through 1980. This slight increase in funding levels is designed to take inflation into account.

In closing, I would like to stress that we are very pleased with the basic goals and directions of the President's energy program. The changes we have recommended are intended to strengthen that program, in order that we can more smoothly and effectively meet those goals. I thank you for your time and attention.

Senator JOHNSTON. Mr. Askew.

STATEMENT OF ALVIN C. ASKEW, DIRECTOR, GOVERNOR'S ENERGY ADVISORY COUNCIL, STATE OF TEXAS

Mr. ASKEW. Thank you, Mr. Chairman. I appreciate the opportunity to meet with you today and share with you our concerns regarding the conservation provisions of President Carter's proposed national energy program.

There is an extrordinary gap between the actual assumptions of the proposed national energy plan and its implementation arrangements and rhetoric. Specifically, the plan has been presented to the Congress and the American people as primarily a plan to limit our use of oil and natural gas while mandating a massive expansion in our use of coal. In fact, however, its success hinges on a massive national production effort in natural gas, oil, and atomic energy, an effort which is clearly evident in the plan's balance sheet.

Let me emphasize a central fact not widely recognized. The energy development requirements given in the President's national energy plan are unprecedented, compared to any 9-year period of our history. His minimum energy production targets for 1985 are one-third greater than our domestic energy production last year. More than half of our 1985 domestic production must come from newly found and newly developed sources.

To achieve his requirements in oil and natural gas in the face of recent and present declines, reserves must be found to provide the energy equivalent of 11 million barrels of oil a day in new production. Simply put, that will require the discovery of about 60 billion barrels of oil or its equivalent over the next 9 years, more than we have ever found in any 9 years of our history.

The President's requirements in coal production over the next 9 years mean an increase seven times the increase of the last 9 years, a period of record coal production.

And the remaining burden of production must fall on nuclear power for which a 380-percent increase is called. This means construction of 75 new plants during the next 9 years, compared to the 63 built over the past generation.

These unprecedented levels of production are required by the President's balance sheet and assume his conservation goals are reached. I think that underscores the necessity of having a national effective program of conservation: national to implicitly include active involvement by State and local government.

They must be met and I believe they can be met, if we thoroughly appreciate the massive job before us. But I am certain they will not be met without an unprecedented and all-out effort to achieve the production and balance-of-payment targets of the national energy plan.

In developing and implementing a truly national effort, the Congress, should not overlook the hard and disturbing fact the Federal

Government owns about 50 percent of our known fossil fuel resources, but last year contributed less than 10 percent of our production. The largest withholder of energy supply in the Nation is the Federal Government itself.

To make the national energy plan work we must begin immediately a full-production effort directed at all our domestic energy resources and we must move quickly toward maximizing the efficiency with which we apply our available energy resources.

Texas and the Nation appear to be at a basic turning point in the history of energy resources, in both production and utilization. Major policy and program decisions at both the State and Federal levels are required to provide an orderly transition through a time of change which threatens to impact major segments of our society by changing our dependence on basic energy sources and by altering the living standards to which we have become accustomed.

Energy conservation must be a major portion of any serious attempt to formulate national energy policy. Initially, conservation can save 1 Btu of energy at less cost to the consumer than the cost of producing that Btu, and the conservation savings can be realized sooner than energy production can be increased.

But since each additional increment of savings through conservation is more costly than the last increment achieved, it cannot replace production. At best conservation can only buy us time to resolve our imbalance between supply and demand.

It has been amply demonstrated in the past few years that proper design of new buildings and associated comfort and lighting systems can reduce their energy consumption from current use by more than 50 percent. Appropriate modification of existing buildings can reduce energy consumption by 20 to 30 percent. As the residential and commercial sector account for 34 percent of the Nation's total consumption, such savings will contribute substantially to the reduction of demand growth.

The implications for the State of Texas are different than those for the Nation because the residential and commercial sector account for only 25 percent of the energy consumed in Texas.

Recent studies at the University of Texas indicate current energy use patterns for single-family residences and for large office buildings in Texas are as indicated in tables A–1 and A–2 of attachment A. It is obvious from these studies that any programs which reduce energy use for heating and cooling and lighting will reduce energy consumption noticeably.

Effective programs for thermal and lighting standards and for appliances will have a major impact on the 25 percent of Texas energy consumed in the residential and commercial sector.

The national energy policy frequently refers to insulation programs. In the Texas climate, the addition of insulation to homes and commercial buildings will have considerably less effect than in Northern States as insulation has a greater impact on heating than on air-conditioning.

Senator JOHNSTON. Could I get you to summarize? I hate to interrupt. You are running out of time. We have been running out all morning. I have read your statement completely.

Mr. ASKEW. That is a difficult task for a Texan. Basically the position we have taken in Texas, we do see substantial problems in the enforcement of such standards. Also, we see substantial problems in the development of standards that are expected to be applied uniformly across the Nation when we have such wide disparities in climate and, in effect, the need for standards across our State alone.

One specific point we would like to make, in Texas there has been a substantial growth in the use of mobile homes, particularly for low-income, young families. These mobile homes are not directly transferable in terms of energy conservation technology to those measures taken for other types of construction.

By way of scale, approximately 10 percent of Texas families currently live in mobile homes and this represents most of the new construction currently in progress for families with incomes of under $10,000. It is imperative any conservation program which dwells with construction standards takes this significant fraction of existing ones into account.

We support the President's proposal, as does Governor O'Neill, for the insulation and thermal efficiency improvement in schools and hospitals. Also, we feel the conservation program for Federal buildings will serve as an effective demonstration of existing technology and substantially accelerate the transfer of that technology on a broad scale.

I would like to echo the concerns voiced by the representative of the Federal Trade Commission. The mandate that the utilities function in the area normally reserved for financial institutions, we have two utilities in Texas presently running programs of that nature on a voluntary basis.

We would encourage that prerogative be made available to utilities. However, due to the poor customer response and in some efforts taken by utilities, we feel that may not be the appropriate vehicle to mandate a nationwide program and more latitude should be given to the Governors of the States to establish a mechanism that is more conducive to their own economic and political structure.

In terms of appliance standards, my testimony addresses that, I think, adequately. I would like to underscore the necessity for any legislation that addresses the need for establishment of appliance standards, take into account the leadtimes involved in making these types of alterations in product technology. Otherwise the consumer could very well find existing appliances in the marketplace are not within his means to purchase.

We would like to again underscore the necessity for local government involvement in a significant role in any conservation program. In the Governors Conference, the sentiment is somewhat uniform in support of the position the factual government closest to the people can have a major impact upon establishing a conservation ethic and until we establish that ethic, we cannot place the conspicuous consumption in which we find energy being wasted today.

We feel the Governors and heads of local units of governments within the State can add stability and credibility to any Federal program.

Thank you, Mr. Chairman, for allowing me to be here today. I would like to be responsive to any questions you might have.

[The prepared statement of Mr. Askew follows:]

STATEMENT OF ALVIN C. ASKEW, DIRECTOR, GOVERNOR'S ENERGY ADVISORY COUNCIL, STATE OF TEXAS

Mr. Chairman, I appreciate the opportunity to meet with this distinguished Committee of Congress to share with you our concerns regarding the Conservation provisions of President Carter's proposed National Energy Program.

There is an extraordinary gap between the actual assumptions of the proposed National Energy Plan and its implementation arrangements and rhetoric. Specifically, the plan has been presented to the Congress and the American people as primarily a plan to limit our use of oil and natural gas while mandating a massive expansion in our use of coal. In fact, however, its success hinges on a massive national production effort in natural gas, oil and atomic energy—an effort which is clearly evident in the plan's balance sheet.

If you study the balance sheet, you will see that it is a two front war with a Conservation Front and a Production Front. The order of battle, the operations procedures, and priorities, and the objectives of President Carter's moral war are not adequately detailed, communicated or considered by the National Energy Plan.

Let me emphasize a central fact not widely recognized. The energy development requirements, given in the President's National Energy Plan, are unprecedented, compared to any nine-year period of our history. His *minimum* energy production targets for 1985 are one-third greater than our domestic energy production last year. More than half of our 1985 domestic production must come from newly found and newly developed sources. To achieve his requirements in oil and natural gas in the face of recent and present declines, reserves must be found to provide the energy equivalent of 11 million barrels of oil a day in new production. Simply put, that will require the discovery of about 60 billion barrels of oil or its equivalent over the next nine years, more than we have ever found in any nine years of our history.

The President's requirements in coal production over the next nine years mean an increase seven times the increase of the last nine years—a period of record coal production.

And the remaining burden of production must fall on nuclear power for which a 380% increase is called. This means construction of 75 new plants during the next nine years, compared to the 63 built over the past generation.

These unprecedented levels of production are required by the President's balance sheet and assume his conservation goals are reached. They must be met, and I believe they can be met, if we thoroughly appreciate the massive job before us. But I am certain they will not be met without an unprecedented and all-out effort to achieve the production and balance of payment targets of the National Energy Plan.

In developing and implementing a truly national effort, the Congress should not overlook the hard and disturbing fact that the Federal Government owns about fifty percent of our known fossil fuel resources, but last year contributed less than ten percent of our production. The largest withholder of energy supply in the nation is the Federal Government itself. To make the National Energy Plan work, we must begin immediately a full production effort directed at all our domestic energy resources, and we must move quickly toward maximizing the efficiency with which we apply our available energy resources.

Texas and the nation appear to be at a basic turning point in the history of energy resources—in both production and utilization. Major policy and program decisions at both the state and federal levels are required to provide an orderly transition through a time of change which threatens to impact major segments of our society by changing our dependence on basic energy sources and by altering the living standards to which we have become accustomed.

Recently, the Governor's Energy Advisory Council in Texas adopted industry, government, and public awareness conservation policies. In summary, Texas supports reasonable federal energy conservation programs and state public information and education programs to increase awareness of the energy situation, to point out the necessity for conservation, and to identify the best ways to conserve.

Energy conservation must be a major portion of any serious attempt to formulate national energy policy. Initially, conservation can save one BTU of energy at less cost to the consumer than the cost of producing that BTU, and the conservation savings can be realized sooner than energy production can be increased. But since each additional increment of savings through conservation

is more costly than the last increment achieved, it cannot replace production. At best, conservation can only buy us time to resolve our imbalance between supply and demand.

It has been amply demonstrated in the past few years that proper design of new buildings, and associated comfort and lighting systems, can reduce their energy consumption from current use by more than 50%. Appropriate modification of existing buildings can reduce energy consumption by 20 to 30%. As the residential and commercial sector account for 34% of the nation's total consumption such savings will contribute substantially to the reduction of demand growth. The Policy proposes the following activities in this area:

1. Mandatory thermal efficiency and lighting standards for buildings by 1980 instead of 1981;
2. Tax incentives for homeowners and businesses;
3. Direct assistance to low income homeowners and to public and non-profit institutions;
4. Improvement of Federally owned buildings;
5. Increased availability of financing for conservation activities; and
6. Increased availability of conservation services (utilities program and public works).

The implications for the State of Texas are different than those for the nation because the residential and commercial sector account for only 25% of the energy consumed in Texas.

Recent studies at the University of Texas indicate current energy use patterns for single family residences and for large office buildings in Texas are as indicated in Table A–1 and A–2 of Attachment A. It is obvious from these studies that any programs which reduce energy use for heating, cooling and lighting will reduce energy consumption noticeably.

Effective programs for thermal and lighting standards and for appliances will have a major impact on the 25% of Texas energy consumed in the residential and commercial sector.

The National Energy Policy frequently refers to insulation programs. In the Texas climate, the addition of insulation to homes and commercial buildings will have considerably less effect than in Northern states, as insulation has a greater impact on heating than on air conditioning. However, if the conservation programs and incentives extend to items such as high efficiency cooling equipment and air conditioning system modifications, they will be of benefit to the national balance sheet through larger reductions of Texas energy demand in this sector. These aspects of the Plan should be clarified. Since "thermal standards" is a generic term which usually involves a great deal more than upgrading the thermal resistance (insulation) of a building envelope, estimates of the impact of the standards program should be developed on the basis of a broader definition of thermal standards than just insulation.

The retrofitting of the existing inventory of residential units is a key element in reducing energy use in the building sector. This area, however, presents many serious obstacles in that retrofitting is often very difficult to accomplish due to (1) the variety of conditions that exist in the built environment, and (2) the inadequate technological procedures required to implement the retrofitting.

A specific effort should be undertaken to develop technological procedures that achieve specific retrofit conservation goals in an effective and cost-efficient manner. This effort should also be aimed at the development of new material assemblies and procedures that will have applications in new construction. This information should be widely disseminated in order to make available the most current technology that can result in the most effective retrofitting program possible.

Mobile home living is popular in Texas. The number of families living in mobile homes doubled in the past five years, with approximately 10 percent of Texas families currently living in mobile homes. It has been the only form of home ownership available which low and middle income families can afford and is the major type of housing being built for families with incomes less than $10,000.

Mobile homes are inefficient users of energy. Implementing energy conservation measures to mobile homes will cost more than expenditures in single family detached houses. Most mobile homes are designed and constructed in such a manner that will not permit implementation of weatherization measures which are currently being applied to other types of dwellings.

Because mobile homes provide an important alternative for low-income, elderly, and young Texas families, non-conventional energy conservation measures should be included in a tax credit plan. If such consideration is not included the cost

of owning mobile homes may become prohibitive due to high utility costs. Fewer families would be able to afford the only hope of homeownership available to them. Middle income mobile home owners would be unable to save for the purchase of other housing, and lending institutions will become more reluctant to finance mobile homes.

The provision allowing tax credits for those who install solar units has a definitely discriminatory effect regionally. Those installing solar units would receive a maximum tax credit of $2,000 that would be phased out by the end of 1984.

Right now, with the tax credit, the installation of solar hot water and space heating units should be economical in northern states. But in the south, where heating requirements are lower and cooling requirements higher, we would not benefit from the tax credits. Solar cooling is not expected to be widely commercialized until the end of 1984, when the tax credit is phased out.

The proposed energy conservation programs for schools and hospitals is not only an appropriate area for tax dollar expenditures, but it is also an area of achievable energy conservation. Schools and hospitals account for a substantial portion of current building space and they will continue to represent a large part of building space through growth. These buildings offer excellent opportunities for energy conservation programs through activities in facility operations, facility modification, and equipment redesign.

Energy conservation programs in federal buildings will serve as a demonstration of conservation practices for similar buildings in the private sector. Their impact will be desirable and should encourage conservation on a broader scale.

The President, through the National Energy Plan, proposes that utilities significantly expand their traditional role in customer service. Since utilities do generally have a customer service program which offers some consultive services, this seems a natural extension. However, many utilities have expressed reluctance to function in the capacity mandated by the Plan. First, they are not, nor do they wish to become, involved in installation of insulation or similar products nor do they wish to become lending institutions. The utility bill is an energy cost in the eyes of the consumer, irrespective of whether it is actually for energy or for other services. They anticipate the development of consumer dissatisfaction as a result of increased "energy" costs, and question whether the availability of additional consumer services will offset the reaction to these increased costs.

Other avenues of providing acceptable consumer conservation services should be explored. The government should seek specific input from utilities and financial institutions before developing these activities.

The implementation of mandatory efficiency standards for major home appliances such as furnaces, air-conditioners, water heaters and refrigerators are proposed in the President's Policy. The present voluntary appliance standards and increasing consumer awareness have already brought higher efficiency appliances to the market place.

High efficiency appliances will require a somewhat higher initial investment but they are attractive on a life-cycle cost basis even at today's utility rates. Mandatory standards will move production more rapidly to high efficiency units as there will be no cost advantage in producing less efficient units. However, in setting appliance standards, manufacturers' costs and time required for redesign and retooling must be considered. It is not possible to redesign and product new equipment overnight. Careful consideration must be given to planning and implementation of such standards. A close liaison must be maintained with producers.

Most energy conservation procedures are economical at 1977 energy prices. Not only does conservation save energy and money but it can increase employment and could ease the immediate requirement for capital investment in energy producing facilities.

In developing and implementing a National Energy Program, the role of government in protecting the public interest and in promoting the public good can be fulfilled by providing stability to facilitate the transition to more acceptable energy alternatives. In energy conservation, credible and creditable information is the essence of stability.

Perception of a situation is also a key factor in motivating behavior. Obviously, if someone does not perceive the need for action, then that action will not be taken. Although the country's leadership believes in the seriousness of our energy shortage, a great many people do not believe that we are involved in a serious energy situation.

Consumers will need assistance from a systematic and well-conceived program of education in efficient energy utilization in the home and at work as a part of the national energy program. Research to obtain reliable information and development of effective ways to disseminate such information should be promoted and supported.

Social acceptance is not presently a motivating factor in energy conservation. The average citizen is somewhat aware of the merits of conserving energy, but does not conserve because of social barriers. People sometimes say, "Why should I conserve? Nobody else does." Or, "Is the energy I consciously conserve being thoughtlessly consumed by someone else? Why should I sacrifice for someone else to squander?" Social motivation plays a very big role in consumer behavior. Until a conservation ethic replaces conspicuous consumption, energy will be wasted.

Stability is important to the abilities of people and institutions to plan ahead with confidence and certainty. Energy conservation planning and programming is progressing at all levels of the public and private sectors. The organizations, systems and procedures that result from this effort will need continued support and funding to insure success and accomplishment, and to provide the people, the institutions and the businesses with the research and resource capabilities for energy conservation. In order to ease this energy transition era, Congress should make full and firm commitments to continue support and funding of the Energy Conservation and Production Act and the Energy Policy and Conservation Act. But to assure that the transition occurs without supply disruptions of disasterous proportions, Congress must enact a total package which addresses both conservation and production of energy. We must return to reliance on our American private enterprise functioning with a minimum of bureaucratic manipulation of our economy—an element sadly lacking in the Administration's proposed Plan.

Senator JOHNSTON. Thank you. The next witness is Richard Maullin.

STATEMENT OF RICHARD MAULLIN, CHAIRMAN, ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION, STATE OF CALIFORNIA

Mr. MAULLIN. Thank you, Mr. Chairman. In the interest of time I will try to paraphrase my statement. In California, conservation is a first priority of State government. We are relying on an interlocking system of energy end use regulation, pricing, and consumer education.

The State has already enacted regulations setting standards for efficiency in buildings. These standards are based on nationally accepted prescriptions for building efficiency. A week from tomorrow, the California Energy Commission will adopt the Nation's first standards for nonresidential buildings based on an energy budget for building types and climatic zones.

We have also taken action in the appliance area. California has the only regulations in force setting energy efficiency standards for three major appliance energy users: freezers, refrigerators, and air-conditioners. We have also banned the constantly burning pilot lights from most gas appliances.

Senator BUMPERS. What do you use?

Mr. MAULLIN. We use an intermittent ignition device. If you can imagine, when you turn on the stove the first click lets out a spark; the second click puts the gas in and it ignites.

Senator BUMPERS. Do those work satisfactorily?

Mr. MAULLIN. They are commercially available, and we have a testing program, like a U.L. laboratory effort, to certify the devices for sale in California. The only place we have encountered any potential

difficulty is with LPG or liquid petroleum gas, so we don't apply the igniter in that area.

In the area of electricity and gas pricing, California has ordered major experimentation with time-of-day pricing and is actively exploring the implementation of marginal cost principles. Furthermore, the California Public Utilities Commission has cases under active consideration which are likely to result in orders to utilities to carry out residential conservation retrofit programs.

All of the State's mandatory conservation programs rely on analyses of their cost effectiveness which have been subjected to cross-examination in public hearings.

As for consumer education, in fact, the number of activities is quite extensive. To point to a few examples, the State has several demonstrations underway of solar heating and agricultural waste conversion to create substitutes for natural gas. We have sponsored energy audits of key industries and organized a low-interest energy efficiency home improvement loan program.

In the transportation sector, we are financing the formation and design of vanpools as the most viable short-range alternative to single-car commuting.

All of these conservation measures, however, are not likely to prove sufficient nor reach their maximum impact if they are restricted to California and a few other States and are supported only by the existing set of Federal conservation programs.

With this in mind, I wish to express my strong support for the principles underlying the President's approach to appliance standards, utility conservation programs, utility rate reform, and solar demonstrations. I would like to discuss each of these measures briefly and provide you my recommendations and those of the energy commission staff.

The President's proposed minimum appliance efficiency standards are needed for four reasons. First: Existing appliance design is a vestige of an era of cheap energy. During the 1950's and 1960's, the marginal cost of producing electricity declined in relation to average cost. This meant that the cost of increased electrical use was lower per unit consumed.

As use increased, price per unit declined. This situation has now changed so that the cost of additional electrical supply is substantially more expensive than current average costs. This trend shows no sign of abating and will accelerate due to rising fuel and construction costs. In this economic environment, the production of inefficient machines is scandalous.

Second: There are technological improvements available now or on the horizon that are not likely to be introduced to the marketplace on a large scale under present conditions.

New developments in electric motors, as Senator Metzenbaum mentioned, or intermittent gas ignition devices need strong efficiency standards which place a premium on inexpensive, yet highly efficient, new designs. Without such force, the industry will continue concentrating on low initial costs with little regard for operating expenses.

Third: Standards are necessary because of market conditions which remove the user of appliances from the purchase decision. Most of us think of appliances as purchases we would make in retail stores. Yet,

over 90 percent of energy intensive appliances such as furnaces and air-conditioners are actually purchased wholesale for new construction.

In this situation, the normal impulse to seek the lowest first cost item cannot be counterbalanced by educating the buyer also to examine the operating costs of the appliance. In these instances, the decision is made for the buyer by the residential builder to whom small discounts on quantity purchases dictate the purchase decision. Minimum standards will assure a higher basic level of energy efficiency for home buyers and apartment dwellers.

Senator JOHNSTON. I hate to interrupt, but let me ask you to summarize a few sentences.

Mr. MAULLIN. Let me move to features of the bill before us. We would recommend section 327 of the Energy Production and Conservation Act be kept. This is the provision which allows States to set standards of their own.

We feel a necessary part of the President's program is the establishment of minimum efficiency standards for the Nation as a whole. We should have minimum standards at the national level that are effective now.

I can testify to the fact that we have standards in effect in California today that the industry can meet. There is no reason these standards cannot be put in nationwide and there is no reason why, when there is a particularly compelling industry reason, and where it can be demonstrated it does not burden interstate commerce, the State should not have the ability to adopt its own standards. We have the ability to do it with automobiles there is no reason why we can't do it with appliances.

Now in California, the State's major gas and electric utilities have been ordered by the public utility commission to construct residential conservation programs. In fact, we expect the initial orders to be out in August mandating these programs. We find these utilities can serve usefully in getting insulation into residences for the following reasons: They are the only institutions in our society that get into these homes once a month with some kind of billing or a meter reader. They have a sense of what is out there; what energy consumption is.

For that reason it is important to take advantage of this contact with the consumer so we can target where we are going and systematically cover the marketplace. Many of the concerns that have been expressed about consumer protection and the design of the program can be handled adequately by an intelligent public utility commission or other State agency.

What I suggest is that the Federal program set minimum standards, apply the best information from other Federal agencies such as FTC, but leave to the States, where able, the flexibility of deciding on these programs and utilizing the utility industry to the best advantage of its own customers.

In the rate reform area, again California has been working for the last 2 years. I would support the time-of-day elements of the utility rate reform. I think the scheme that would be appropriate at the Federal level for a national energy program would be to set minimum standards, the criteria for an effective program at the Federal level, and where States are capable, where they have shown

they are already moving in that area, where they rely on State rate-setting commissions to translate rate-design principles into effective conservation-producing structures.

It is important with the Federal minimums to make sure that capability for State government action is left intact by Federal legislation. But at the same time it is necessary to put into Federal law an ability by the Department of Energy to mandate the type of reforms we know from an economic point of view make sense nationwide.

Finally, in the area of solar demonstrations, again the State of California is investing a good deal of its own money in the demonstration of solar techniques. I want to support the comments of the other witnesses that solar is not a faraway exotic technology; it is a here and now opportunity by operators of commercial buildings to take advantage of the reduction in operative costs that come from using the Sun's energy.

I would suggest that the Federal program be expanded, beyond reliance on active solar systems using mechanical devices. The concept of passive solar ought to be incorporated as part of the criteria for Federal programs.

Solar passive systems utilize the building design and architecture to maximize the building's use of solar energy without mechanical devices. It is efficient and cost-effective and should be incorporated wherever feasible.

Prior to a solar system being installed on a building, all possible conservation measures should be implemented. A solar system is efficiently sized only when the building it serves is operating in the most energy-conserving manner possible.

The smaller the heating load, the smaller the solar system needed, and the lower the cost for the system. Those buildings designated for solar retrofit should be required to meet an energy conservation standard tied to efficient collector sizing rather than to a percentage of energy saved.

The Federal building program should be approached not only as a demonstration program, but as a real-time answer to rising costs and uncertain fuel availabilities. Thus, the emphasis should be aimed at teaching building managers, specification writers, and Government agency financial analysts to use solar technologies on a continuing basis.

Finally, we feel the Federal program ought to be extended to State and local buildings. The point is, we want to demonstrate these technologies and use them where best applicable.

That paraphrases my statement, Mr. Chairman. I will be happy to answer questions later.

[The prepared statement of Mr. Maullin follows:]

STATEMENT OF RICHARD L. MAULLIN, CHAIRMAN, ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION, STATE OF CALIFORNIA

Mr. Chairman and members of the committee, it is a pleasure to respond to your invitation to testify on aspects of the proposed National Energy Plan.

The ever-rising price of oil, the depletion of domestic gas supplies, and the uncertainties surrounding nuclear power all are warning signals that we Americans cannot go on indefinitely producing energy to meet the demand for it at any cost.

Instead, we need to adopt an aggressive and effective program to achieve energy efficiency—both by practicing conservation, and by creating what we might call an energy-frugal society.

This is a particularly opportune time to achieve a better balance in energy priorities. The Congress and the Administration, with the National Energy Program now on the table, may find this the psychological moment to begin curbing our insatiable appetite for energy.

Much greater effort to implement energy conservation is a vital element of any intelligent national policy—not only because it is inherently virtuous but because it makes sense in terms of energy, the environment and the economy. After three years of often-frenzied attempts to increase energy supplies to achieve independence from foreign oil imports, it has now become apparent that simply trying to satisfy demand is an exercise in futility.

It will require less investment to save a barrel of oil through efficiency than to add a new barrel of oil through production, especially over the next dozen years. This is the view of the U.S. Energy Research and Development Administration as well as most other serious energy analysts.

Furthermore, energy conservation generally complements, rather than conflicts with, environmental protection. The benefits of energy conservation measures include not only the direct savings in fuel, capital and land, but also the breathing time and flexility to develop new oil, gas and coal sources, to improve nuclear plant safety, and disposal of radiological waste and to commercialize solar techniques.

Unfortunately, however, conservation is no cure-all; while essential, it is probably insufficient by itself as a solution to our energy problems. Energy Conservation involves either increasing efficiency, or practicing self-denial. There is much disagreement over just how much fat or inefficiency exists in our energy system (estimates range from 10 percent to nearly 50 percent), and differing opinions on how much austerity consumers—especially in the United States—are willing or should be compelled to bear.

Further, there is considerable debate over what measures are the most effective and the most equitable to reduce electric and gas demands and to curb the profligate consumption of petroleum, especially in the transportation sector.

In California, conservation is a first priority of state government, and we are relying on an interlocking system of direct end-use regulation, energy pricing and consumer education to achieve energy savings.

The state has enacted regulations setting standards for the energy efficiency of buildings. These standards are based on nationally accepted prescriptions for building efficiency. A week from tomorrow the California Energy Commission will adopt the nation's first standards for nonresidential buildings based on an energy budget for building types and climatic zones.

We have also taken action in the appliance area. California has the only regulations in force setting energy efficiency standards for three major appliance energy users: freezers, refrigerators and air conditioners. We have also banned the constantly burning pilot lights from most gas appliances.

California's appliance standards have been the subject of much controversy. The Association of Home Appliance Manufacturers (AHAM) and other industry associations have attempted to have the Federal Energy Administration preempt our standards. AHAM has also been working in the Congress to keep appliance standards as weak as possible and to severely limit states from enacting appliance regulations. To date, FEA and the courts have rejected AHAM's petitions as being without merit, while some major appliance manufacturers such as Amana and Carrier Corporation have supported many elements of the state's appliance regulations. I will return to the appliance proposal in the President's program in a moment.

In the area of electricity and gas pricing. California has ordered major experimentation with time-of-day pricing and is actively exploring the implementation of marginal cost principles. Furthermore, the California Public Utilities Commission has cases under active consideration which are likely to result in orders to utilities to carry out residential conservation retrofit programs.

All of the state's mandatory conservation programs rely on analyses of their cost effectiveness which have been subjected to cross-examination in public hearings.

As for consumer education, in fact, the number of activities is quite extensive. To point to a few examples, the state has several demonstrations underway of solar heating and agricultural waste conversion to create substitutes for natural

gas. We have sponsored energy audits of key industries and organized a low interest energy efficiency home improvement loan program.

In the transportation sector, we are financing the formation and design of vanpools as the most viable short range alternative to single car commuting.

All of these conservation measures, however, are not likely to prove sufficient nor reach their maximum impact if they are restricted to California and a few other states and are supported only by the existing set of federal conservation programs.

With this in mind, I wish to express my strong support for the principles underlying the President's approach to appliance standards, utility conservation programs, utility rate reform and solar demonstrations. I would like to discuss each of these measures briefly and provide you my recommendations and those of the Energy Commission staff.

The President's proposed minimum appliance efficiency standards are needed for four reasons.

First, existing appliance design is a vestige of an era of cheap energy. During the 1950s and 1960s, the marginal cost of producing electricity declined in relation to average cost. This meant that the cost of increased electrical use was lower per unit consumed. As use increased, price per unit declined. This situation has now changed so that the cost of additional electrical supply is substantially more expensive than current average costs. This trend shows no sign of abating and will accelerate due to rising fuel and construction costs. In this economic environment, the production of inefficient machines is scandalous.

Second, there are technological improvements available now or on the horizon that are not likely to be introduced to the market place on a large scale under present conditions. New developments in electric motors, as Senator Metzenbaum mentioned, or intermittent gas ignition devices need strong efficiency standards which place a premium on inexpensive yet highly efficient new designs. Without such force, the industry will continue concentrating on low initial costs with little regard for operating expenses.

Third, standards are necessary because of market conditions which remove the user of appliances from the purchase decision. Most of us think of appliances as purchases we would make in retail stores. Yet, over 90 percent of energy intensive appliances such as furnaces and air conditioners are actually purchased wholesale for new construction. In this situation, the normal impulse to seek the lowest first cost item cannot be counterbalanced by educating the buyer also to examine the operating costs of the appliance. In these instances, the decision is made for the buyer by the residential builder, to whom small discounts on quantity purchases dictate the purchase decision. Minimum standards will assure a higher basic level of energy efficiency for home buyers and apartment dwellers.

Finally, even if increasing energy prices argue against appliance standards, the possibility of rapid energy savings alone argues for them. Major appliances currently account for most residential electrical use and their proportion is likely to increase with rising income, increased appliance saturation, and additional product lines. Improvements in efficiency can help reduce the electrical growth rate to the levels targeted by the President. We estimate that within ten years, the California standards will result in a savings of 8 million barrels of oil a year. This theoretically avoids the need for 2,000 megawatts of new electrical capacity.

For these reasons the Energy Commission supports President Carter's proposal to amend Section 327 of the Energy Production and Conservation Act to establish nationwide minimum appliance efficiency standards. The President's proposal would limit any real burden on interstate commerce by ensuring that major appliances sold in all states meet minimum requirements. At the same time, however, features of the existing law would be retained which enable states to set standards for products in the absence of Federal standards. In those cases where states have set standards, Section 327 would allow these standards to remain in effect unless industry can prove that adverse impacts on interstate commerce outweigh the benefits to the local area. Retention of this provision is important for several reasons:

1. It ensures that minimum efficiency standards for appliances are in effect at the earliest possible time. If a state were preempted prior to implementation of federal standards, no standards would be in effect until the Federal government completed the lengthy process of reviewing state standards and/or developing and implementing its own.

2. The existence of state standards serves as an important impetus to timely and well-developed federal standards on appliances.

3. It enables states to serve as a model and test ground for the practicality of appliance standards. This will provide a good mechanism for evaluation of federal efforts and will provide for earlier introduction of more efficient machines than is possible under current federal rules.

Section 327 as it already exists ensures that appliance efficiency standards will be implemented quickly and fairly. Except as provided in the President's proposal, Section 327 should continue as federal law.

UTILITY CONSERVATION PROGRAM

I will now turn to the President's proposal requiring utilities to offer energy conservation and loan financing to residential customers.

Earlier this year, the California Energy Commission adopted its Conservation Plan supporting increased use of the utilities' technical, informational, and financial resources to support energy conservation on a level comparable to that traditionally devoted to energy supply alone. The Commission's policy includes making use of its certification authority over power plant sites and facilities in cooperation with the California Public Utilities Commission's authority over rate structure and utility operations. The Energy Commission and the PUC have agreed to establish economic incentives as well as requirements for each utility company's energy conservation program.

On the basis of our interest and involvement in developing utility conservation programs, we have the following recommendations to make on President Carter's use patterns.

The services required of utilities should be available to small- and medium-sized commercial customers whose energy use patterns are similar to residential use patterns.

The energy conservation measures which are eligibility for utility assistance should be flexible to include new measures and innovations as they are identified. The list contained in the current proposal does not contain this flexibility.

In many states, such as California, there is more than one state regulatory agency executing energy policy. The President's proposal should be changed to allow the Governor of each state to select the appropriate regulatory agency or agencies to carry out the utility program.

The Administrator or Department Secretary should issue Federal minimum standards for the Residential Energy Conservation Plans. States should have the opportunity to develop plans and submit them to the Administrator for review. Once approved, the state should be responsible for implementing the plan. In cases where a state fails to submit a plan, the Administrator should then promulgate a plan for the state. This would ensure that the Residential Energy Conservation Plans take maximum advantage of the energy conservation potential and experience of each state.

Utilities should be allowed to enter into cooperative agreements with other regulated or non-regulated companies to provide services to avoid unnecessary duplication where utility service areas overlap.

After a prescribed grace period, no regulated utility should provide services to an uninsulated building when it is feasible to insulate the building.

Any loan financed through the utility program should be payable by the resident of the building to which service is rendered. If a tenant moves, the loan should be assumed by the new tenant since it is the new tenant who is reaping the benefits of the investment.

Based on our experience, I feel it is imperative that states be involved in these utility programs to the maximum extent. If states develop the implementation plans, the Federal government can take full advantage of the experience and familiarity with local or regional conditions found in state agencies. Furthermore, since many of these state agencies are already working on this program, there will be less need for additional bureaucracies at the federal level.

UTILITY RATE REFORM

Utility rate reform is an exceedingly important feature of an effective energy conservation program. Price is the basic mechanism by which our society makes its choices about goods and services. The price of electricity, in large measure, determines the number and type of power plants we need and the kinds of appliances and industrial processes we use. The price of gas determines which customer class will use it or a substitute such as solar energy.

Traditional rate structures, with declining price blocks for incremental consumption of electricity and gas, are not adequate in the present context. Rapidly rising costs coupled with continued high demand have produced seemingly constant rate increases for consumers and earning instability for utilities.

Electricity and gas prices must be designed to perform three basic functions:

Maintenance of the financial health of the utility;

Efficient allocation of resources; and

Distribution of the cost of electricity and gas service fairly among beneficiaries of the service.

California has been involved in conservation-oriented rate reform for several years. Two years ago, California Public Utilities Commission decided against declining commodity charges based on consumption and that the highest rates should be paid by the lowest priority users. The CPUC, in the interest of protecting the residential user and encouraging conservation, also implemented lifeline rates to cover the minimum needs of the average residential customer. These rates vary seasonally to reflect heating requirements. These policies have led to the flattening of commercial and industrial rates at prices higher than the lifeline rate and inverted rates for residential customers. The CPUC is now working on the implementation of a multi-tier inverted rate structure for residential customers.

California has already recognized the cruical role that rates play in encouraging energy conservation, and we are using our regulatory powers to require conservation. In light of the substantial progress towards conservation promoting rates in California, I feel strongly that legislation in this area should build in maximum flexibility so that state momentum is not stymied. President Carter's proposal to allow the FEA Administrator to determine rates without any consideration for regional or state differences ignores regional realities. The proposal to give the Administrator the authority to determine the acceptability of a stae's implementation efforts without any formal mechanism for states to participate or appeal indicates an area where additional language recognizing state roles is needed.

SOLAR DEMONSTRATIONS IN FEDERAL BUILDINGS

Another important measure in the President's plan is the demonstration of solar energy systems in federal buildings.

California is spending over $570 thousand to incorporate solar water and space heating systems into existing state buildings and to redirect building design towards energy conserving solar methods.

From our experience in designing and implementing solar demonstrations in state buildings, I offer the following suggestions for the President's federal building program:

The Federal building program should be expanded to include passive solar systems. Active solar systems utilize mechanical devices to produce the desired result—in this case solar hot water and space heating. Solar passive systems utilize the building design and architecture to maximize the building's use of solar energy without mechanical devices. It is efficient and cost-effective and should be incorporated wherever feasible.

Prior to a solar system being installed on a building, all possible conservation measures should be implemented. A solar system is efficiently sized only when the building it serves is operating in the most energy conserving manner possible. The smaller the heating load, the smaller the solar system needed and the lower the cost for the system. Those buildings designated for solar retrofit should be required to meet an energy conservation standard tied to efficient collector sizing rather than to a percentage of energy saved.

The Federal building program should be approached not only as a demonstration program, but as a real time answer to rising costs and uncertain fuel availabilities. Thus, the emphasis should be aimed at teaching building managers, specification writers and Government agency financial analysts to use solar technologies on a continuing basis.

This program should not be limited to Federal buildings. There may be cases where it would be more appropriate to utilize State or local buildings to demonstrate various solar technologies. The basic point, however, is that public buildings are usually of a type similar to private commercial buildings. A well-planned and diverse selection of projects can provide invaluable information and experience for the Nation's commercial sector.

The development of a new energy ethic of this sort implies our fundamental transition from an industrial to a post-industrial society—from a society em-

phasizing material growth to one that emphasizes frugality and human growth. This transition, of course, would take many decades and require major changes in our educational system, in our economic structure and in our basic values, Over the long term it could provide more jobs and a better overall quality of life. but an abrupt transition would be difficult both technically and politically, and would have a harmful effect on employment and the economy.

So energy frugality is a long-range goal. However, "long-range" refers not to when we must begin, but to the time needed for realizing fundamental change. What we must do is begin today with more conventional conservation measures, for even they demand a substantial investment of time and money. A determination to achieve major changes in consumer habits, and, most importantly, an exercise of sustained political will.

I urge your committee to support the President's conservation programs and to consider these suggestions for their more exact specification.

Senator JOHNSTON. Thank you very much. The next witness is John Millhone, of the National Governors Conference.

STATEMENT OF JOHN P. MILLHONE, STAFF CHAIRMAN, SUBCOMMITTEE ON ENERGY CONSERVATION, COMMITTEE ON NATURAL RESOURCES AND ENVIRONMENTAL MANAGEMENT, NATIONAL GOVERNORS' CONFERENCE

Mr. MILLHONE. Senator, members of the committee, it is a pleasure to be back here again. I appreciate the opportunity to testify. Before proceeding with my statement which I will summarize briefly, I would like to say a few words about the National Governors Conference. The NGC, as it is called, is the sole national organization representing the Nation's Governors.

Several years ago, the conference established the Committee on Natural Resources and Environmental Management to oversee the development of national policy in the area of environment, energy, and natural resources. The Subcommittee on Energy Conservation, of which I am staff chairman, functions under the Committee on Natural Resources and Environmental Management. Minnesota Gov. Rudy Perpich chairs this subcommittee; Gov. Julian Carroll, of Kentucky, is now chairman of the Natural Resources and Environmental Management Committee.

My statement is delivered on behalf of the subcommittee and reflects the concerns of its members.

The subcommittee commends the President for taking the initiative and formulating a comprehensive national energy plan. It reflects the concerns the Governors have in the area of conservation.

The principal points which are made in my statement are, first, the programs being considered should be built on the work already underway in the States through the EPCA—Energy Policy and Conservation Act—and its supplemental programs.

There is a great deal of current work in the States in developing energy conservation areas, not only those areas mandated by those laws, but also in other areas. If you look at the requirements of those programs, a 5-percent reduction in what the States would otherwise consume in the year 1980, you are looking at an energy saving of something in the range of 4.1 quads or 2 million barrels a day. So a very significant target has been set there.

For a significant target to be achieved under the EPCA program, the progress the States are making is, I think, quite astonishing com-

pared with the start by some States and the delay by FEA in developing guidelines for the program.

Currently all 50 States have submitted or are completing the preparation of energy conservation plans. Some would achieve a saving of as much as 11 percent. The mandatory areas would accomplish only 1 to 2 percent of the required savings, which has led to an imaginative and creative development of programs by States in other areas. Those are detailed in my testimony.

I would like to ask these programs be continued through 1980, because this would permit the States to continue the momentum that has been developed. I would also ask, in looking at some of the provisions of the President's proposal such as the utility proposal that has been discussed, that the States be the vehicle for delivering this program.

The problems with using utilities have been detailed by other witnesses. I agree with those statements and have additional comments on this in my prepared remarks.

The States would like to see the Governors given the responsibility of determining the delivery mechanism that will work most effectively within their State. In some instances this would be utilities, in other instances there are housing finance agencies already performing such kinds of functions.

In order to have the flexibility within the State to make this necessary, we think this responsibility should go to the State. There is also the question of the adequacy of the funding. There has been testimony in other committees indicating, with all of the proposed authorized funding for the weatherization program, only 2.1 million homes could be covered through 1980.

Other testimony shows there are some 5 million homes that are underinsulated. There needs to be some consistency in the targets set up under the legislation and the funding used to achieve those targets.

The other areas mentioned are the need to develop some kind of programs that deal with renters. This is a program that sort of falls through the cracks. The others make certain consumer protection is provided.

These are the principal topics I cover under my testimony. I think my comments will serve as a summary of the statement.

Senator JOHNSTON. Thank you.

[The prepared statement of Mr. Millhone follows:]

STATEMENT OF JOHN P. MILLHONE, STAFF CHAIRMAN, SUBCOMMITTEE ON ENERGY CONSERVATION, COMMITTEE ON NATURAL RESOURCES AND ENVIRONMENTAL MANAGEMENT, NATIONAL GOVERNORS' CONFERENCE

Mr. Chairman, members of the Committee, my name is John Millhone. I am staff chairman of the NGC Subcommittee on Energy Conservation and Director of the Minnesota Energy Agency. I appreciate the opportunity to appear before you today to testify on the energy conservation provisions proposed in the President's National Energy Policy Act of 1977.

Before proceeding with my statement, I would like to take this opportunity to say a few words about the National Governors' Conference. The NGC, as it is called, is the sole national organization representing the nation's Governors. Several years ago, the Conference established the Committee on Natural Resources and Environmental Management to oversee the development of national policy in the area of environment, energy and natural resources. The Subcommittee on Energy Conservation, of which I am staff chairman, functions under the Committee on Natural Resources and Environmental Management. Minnesota Governor Rudy Perpich chairs this Subcommittee; Governor Julian Carroll of

Kentucky is now chairman of the Natural Resources and Environmental Management Committee.

My statement is delivered on behalf of this Subcommittee and reflects the concerns of its members.

The Subcommittee commends the President for taking the initiative and formulating a comprehensive National Energy Plan. The Plan, as proposed, reflects the priority the nation's Governors placed on energy conservation in the drafting and adoption of the National Governors' energy policy position in the summer of 1974.

As stated in the NGC policy:

"A conservation program of massive proportions must be the central focus of the nation's short-range energy management program. . . . The nation's Governors are dedicated to promoting the conservation of energy."

Under the leadership of the Governors, several States had already begun to develop effective energy conservation programs when Congress passed the Energy Policy & Conservation Act in 1975. The Governors, therefore, applaud the intent of the President to make energy conservation "the cornerstone of national energy policy," and the member States of the NGC Subcommittee on Energy Conservation stand ready to work with Congress and the Administration to develop a successful initiative.

The proposed conservation initiatives in the National Energy Policy Act must be examined in light of the framework that already exists to mobilize a national energy conservation program. This framework was put in place by the passage of the Energy Policy and Conservation Act of 1975, the Energy Conservation and Production Act of 1976 and on individual state initiatives.

Acting under the requirements of the State Energy Conservation Program, the States are now in the process of establishing: Statewide thermal efficient building standards; building lighting standards; procurement practices to provide incentives for the purchasing of energy efficient products; and conservation initiatives in the transportation sector.

In addition, the States are preparing to undertake energy conservation initiatives in excess of these programs that will enable the States to achieve the mandated goal of the legislation—a 5 percent energy savings from projected usage in 1980. All fifty States are participating in this program, and despite the long delay in issuance of the final guidelines by the FEA, forty-six States have submitted their plans. Several states' programs have been formulated to achieve as much as an 11 percent energy savings of projected usage in 1980.

Since the mandated programs can only achieve a 1–2 percent energy savings, it was necessary for the States to exert their initiative and innovativeness to achieve the called for objective. Iowa's plan includes a provision to establish a revolving loan fund, with $50,000 appropriated by the State to assist low-income groups in weatherizing their homes, and another that requires a homeowner purchasing his residence prior to January 1, 1978, to install insulation prior to sale. The Minnesota Energy Agency will be developing standards for existing buildings and is planning a survey of the energy consumption of schools. Massachusetts is initiating a program in public housing. The primary goal is to lower energy costs of these units and they will look at more energy efficient construction of public housing, retrofitting of existing housing, conservation education programs for tenants, demonstration projects and energy audits. California is starting a program that will change the professional licensing process that will test candidates' knowledge of energy conservation. The program will concentrate on architects, engineers, contractors, landscape architects and accountants. There is a great potential for energy savings when States are able to develop programs which fit the circumstances in their States.

In addition to the State Energy Conservation Program, States are just beginning to work on their supplemental plans which have been mandated by the Energy Conservation and Production Act. Under this program, States will be performing the following important functions: Providing energy conservation information to consumers; coordinating local, state and federal energy conservation programs; and developing the capacity to perform energy audits at no direct cost to homeowners.

The State Energy Conservation Program and the Supplemental Plan Program have been instrumental in giving many States the impetus and resources needed to develop effective energy conservation programs. The programs have strengthened the infrastructure which will be available not only to continue the implementation of the existing programs, but to implement and coordinate new programs as proposed by the national energy bill. State energy offices are now

coordinating the weatherization program, the energy extension program and the performance standards program (HUD). Though the President's energy legislation provides no new authorization to state energy offices, under the existing manddate of the Supplemental program stating that States must coordinate local, state and federal programs, the State energy offices will be responsible for coordinating the utility insulation program and the energy conservation program for schools and hospitals.

The mandates of the State Energy Conservation Program and the Supplemental Plans Program have provided States with the capacity to take the initiative in energy conservation. The States utilizing the resources provided by these legislative measures have been able to implement effective programs. If the authority granted to the States under these two programs is not extended, the basis of the state energy conservation initiative will be lost. These two programs would allow the States to maintain the capacity to assure effective energy conservation programs and coordinate any local, state and federal initiatives. For instance, the States, while working toward the development and implementation of thermal efficiency building standards under the State Energy Conservation Program, will have laid the foundation for the implementation of the HUD performance standards program which is expected to be promulgated in 1980.

There has been some concern that the State Energy Conservation Program is not being effectively implemented, but there have been several problems in the administration of the program which limited the actions of the States. First of all, the guidelines were issued five months late after most state legislatures had adjourned. Most States were then left with only one full legislative session in which to adopt the five mandatory elements in the program. Even though the guidelines were late, the deadline for having the five required elements in place was not changed. Furthermore, the Administration was hesitant about implementing the program and the total appropriation for the three years of the program will thus only be $80 million as compared to the authorized level of $150 million. The goals and requirements of the program were related to the amount authorized to be appropriated. Even though the appropriations have been less than authorized levels, the goals and requirements have not been altered. The States have still submitted plans which attempt to reach the goals. The programs need implementation through 1980 for the accomplishment of the 5 percent energy reduction. However, the program is now scheduled to end in 1978, two years short of 1980. Therefore, to fully implement the program, and not delay implementation, plus maintain the capacity to deal with new programs, these programs should be extended. They should be included as part of the National Energy Plan.

In dealing with the President's proposals, it is important that Congress recognize the capacity of the States and not establish new mechanisms or programs where existing ones might already be accomplishing the same objectives or would have the capacity to accomplish the same objectives. For instance, the utility program as proposed authorizes utilities to provide energy conservation information and services to their customers. The Administration's utility program which requires a specific delivery mechanism poses the following problems: lack of financial capacity on the part of some utilities; lack of interest on the part of some utilities to participate in the program; the issue of the utilities' conflict of interest; the existence of state laws which might prevent some utilities from initiating these types of activities, and insufficient coverage of all fuel sources.

In addition, there are already existing programs in the States or the private sector which accomplish similar goals. Under the Supplemental Plans Program, the state energy offices are also authorized to provide energy conservation information and to encourage and provide energy audits. When the Energy Extension Service becomes nationwide in FY 78, the States will be providing these two services on a decentralized basis. If these two programs are adequately funded, the state energy offices will have developed the capacity to accomplish at least two of the major objectives of the utility insulation program.

For these reasons, and for maximum coordination and effectiveness in a State, it might have been more effective if the national energy plan had built upon the capacity of the States and directed them to devise a plan to encourage residential energy conservation using appropriate mechanisms as opposed to specifying utilities as the delivery mechanism. Then a program could be designed utilizing existing programs and tailoring them to the needs and individual characteristics of the States. This approach would allow for the use of utilities as information, dissemination and vehicles where appropriate.

Similarly, the Energy Conservation Program for schools and hospitals should also be coordinated by the Governor with other existing energy programs in the State. It is important that the program be administered by the ageny that would be able to evaluate energy conservation needs and to provide technical assistance in terms of what measures should be implemented.

The President is currently proposing to increase the authorization for appropriation for the Weatherization Program from $65 million to $130 million in FY 78, from $80 million to $200 million in FY 79, and $200 million in FY 80. In a Committee Report by the Senate Committee on Banking, Housing and Urban Affairs last year, it was stated that FEA estimated that at least 5 million homes occupied by low-income persons are inadequately insulated. The Report also notes that the average cost to weatherize such homes would be around $250 for homes in warmer climates and $350 in colder climates. Using the average figure of $300 per home for basic expenditures, the amount authorized to be appropriated (and the $110 million already appropriated for FY 77) should weatherize approximately 2.1 million homes. If the goal is to weatherize the five million homes, then the amount of money for weatherization for the homes of low-income people should be increased over an extended period of time.

The President has also proposed increases for States and local jurisdictions to meet the cost of adopting and implementing performance standards or of administering state certification procedures. While there is general support for such increases, there should be some study with state and local officials to determine whether these amounts are adequate to meet the needs of the program. In many instances, if the States do not have in place a statewide building code program, an institutional framework must be developed and this would be costly. This is an administrative cost which must be paid before the cost of implementing the standard is added.

In addition to these general comments, there are other problems which need consideration. The programs do not appear to address the issue of renters and what would be the most appropriate method to involve landlords in the energy conservation effort. Since there is a large number of multifamily units, their energy consumption must be addressed. Another set of issues would relate to consumer protection. For instance, if the federal government is advocating that residential customers install and implement certain measures, then product certification and standards should be set to protect the consumers where they are available. When a suggested list of contractors is drawn up, there should be procedures to insure competition among contractors.

We want to thank you for the opportunity to testify before this Subcommittee and would like to make available to you the assistance of the NGC Energy Program, which staffs the Committee on Natural Resources and Environmental Management. Edward L. Helminksi is Director of the Energy Program (624–5370).

Senator JOHNSTON. We will hold our oral questioning to 2 minutes and submit the rest in writing. First of all, Governor O'Neill, should the State run insulation-certification programs or should the Federal Government do that?

Mr. O'NEILL. I think the State should have that opportunity, Mr. Chairman. The legislation provides for public utilities—I think in keeping with all of the other people here, members of this panel who made mention of the fact full discretion should be maintained by the Governors, specifically in their States, because of variations, I think we ought to maintain that authority for the Governors specifically.

Senator JOHNSTON. The reason I asked you, you said there was a need for a certification program, but you would have problems of consumer complaints. That would, I take it, be within the power of the State to correct?

Mr. O'NEILL. That is correct.

Senator JOHNSTON. Are you then asking us to come up with certain standards as well?

Mr. O'NEILL. I think Mr. Maullin specifically addressed what we made mention of in earlier testimony. I think bare essentials within

the standardization form that could be set aside with the Federal Government. I do think the States specifically should have an opportunity to make more stringent rules and guidelines for operation of installation of insulation materials.

Senator JOHNSTON. Many States don't have a housing program. It seems to me there ought to be some Federal program—let me make one observation that is with respect to California.

To me it is absolutely incredible California could have come out with its standards so far ahead of the Federal Government. With the great resources we have here, you have beaten the Federal Government to the punch. It is a whole subject I would like to explore, but I don't have time.

I don't know why we have to be so slow.

Mr. MAULLIN. If I could make one comment, Senator. We have actually worked very closely with the FEA at the staff level in developing our mandatory standards. You have the analogous situation where you say the ones in the Army know what to do and the Generals have been more reticent. That is reality.

Senator WEICKER. First of all, a couple of questions to Mr. Askew. You made the comment conservation could hold the line but really the solution was probably in the area of production. Am I correct in the paraphrasing?

Mr. ASKEW. That is correct, sir.

Senator WEICKER. What do you think of President Carter's energy program when it comes to the production side?

Mr. ASKEW. Senator, our best estimate is it would involve slightly in excess of 4 million barrels per day, equivalent barrels of oil in both our estimate in terms of their optimistic coal expansion would indicate the best estimate right now is about an additional 2 million barrels a day shortfall.

You cannot project the shortfall in the area of atomic energy, but unless those plants, among the largest built today, 75 plants won't make that increase. It will be closer to 100 or more plants to fill that 100-percent increase in nuclear energy, with the uncertainty and when this process would start.

I think it highly unlikely we will develop those production levels by 1985.

Senator WEICKER. Does it upset you, for example, the moneys that will be accumulated through the Carter plan, the taxes per barrel of oil is going to the Federal Government rather than those entities charged with the discovery in producing oil and gas? I should imagine the capital requirements are enormous.

We are not the ones into discovering oil and gas and we are the ones that are going to get the money by decontrol of tax, if you will, as part of the plan.

Mr. ASKEW. That is one of the incongruities we find in the President's statement. He expresses the price charged to the consumer will be replacement cost of energy, but a portion of that replacement cost would be redirected to consumers by rebates. I am not an economist.

That tells me we are not going to replace our current levels of inventory unless we can get replacement capital from another source. I don't see that source being available with the competing needs in this energy program for investment, for insulation, other conservation measures,

increased taxation of other resources. I do not see those production levels coming on line.

Senator WEICKER. One brief last question to other members of the panel. Do you find the President's program—I will direct my question to Governor O'Neill, principally—falls short, the overall energy package falls short in its lack of emphasis on mass transit, bus and rail?

If we are talking about conservation, isn't that a necessary ingredient to any sort of conservation program?

Mr. O'NEILL. I would have to agree with you, Senator. We are presently working with our respective congressional delegations in New England, the Coalition of Northeast Governors to bring about some conservation programs one of which is in the U.S. House of Representatives, another in the planning stage about to be forwarded by the New England caucus, to fit in the Massachusetts transportation center in Massachusetts.

We think to really address the need in the program, somewhere in the vicinity of $550 to $600 million is needed to pursue conservation within the transportation sector. I don't think this energy program set aside by the President in his energy policy will attempt to address the transportation conservation needs.

Senator BUMPERS. Mr. Millhone, are you familiar with the Energy Extension Service?

Mr. MILLHONE. Yes.

Senator BUMPERS. Are the States making application under that right now, do you know?

Mr. MILLHONE. Mr. Chairman, Senator Bumpers, yes, they are. At the bidders conference I think all but four States attended, it seems most of the States will submit application for the energy extension program.

Senator JOHNSTON. Mr. Mabry?

STATEMENT OF GUY O. MABRY, VICE PRESIDENT, INSULATION OPERATING DIVISION, OWENS-CORNING FIBERGLAS CORP.

Senator JOHNSTON. Gentlemen, if you could limit your statement to 5 minutes.

Mr. MABRY. I will try to summarize as much as I can. The committee has been provided with a notebook which deals in detail with research on which my statement is based.

I will comment briefly on the proper minimum standards for achieving residential energy efficiency in new construction and existing homes.

Also, the insulation trends in existing homes, factors affecting demand, projecting capacity, pricing history, and the role of utilities in conservation.

First: The subject of insulation standards. A critical factor in either new construction or in a retrofit program involves setting the proper minimum standards for insulation levels and installation.

As background, I should explain that insulation performance is measured in R values. The R stands for thermal resistance to heat. the higher the R, the better the insulating value of that material. Measuring insulation materials in inches is imprecise. For example, it

requires 8¾ inches of glass fiber loose fill insulation to equal the thermal performance of 6 inches of glass fiber batt insulation. Similarly, R values vary among insulating materials such as rockwool, cellulose, foam, or any of the many other types which are on the market.

These variations among insulating materials must be taken into consideration in determining insulation standards for thermal performance, product safety and quality. In addition to the proper R value, standards must also deal with the method and quality of installing insulation so that homeowners are assured of proper thermal performance.

Glass fiber blanket or batt insulation is factory produced to a certain density, thickness and thermal resistance. The National Association of Home Builders Research Foundation certifies that the performance of blanket type insulation that is labeled meets or exceeds the R value stated on the package.

In contrast, the R value achieved by loose fill or pneumatically blown insulation depends upon the quality of installation. This variable creates a greater potential for exploration of the consumer, regardless of the type of insulation material used. Consideration should be given to establishing an inspection procedure which would certify for the homeowner the quality of the installation performed.

Senator JOHNSTON. Who should do that?

Mr. MABRY. I would hope that would be developed for a third party so whoever was involved in the sale or installing of the material was not involved in inspection.

Senator WEICKER. Can I interrupt for a moment? Do you feel, for example, banks are as qualified as utilities in this area since they have traditionally done much of the lending for these home improvement projects?

Mr. MABRY. Yes, because some banks demand an inspection of home improvements. There are some savings and loan institutions trying to develop a third party inspection service now. They would like to introduce this nationally, but their efforts are to train a third party force of quality auditors. They would not be savings and loan or contractor employees.

At present, there are significant differences among the various insulation standards being recommended to homeowners. FHA minimum standards are lower than those recommended by the Farmers Home Administration, the National Bureau of Standards, and the Edison Electric Institute. The administration's proposed national energy plan does not define specific insulation standards.

Owens-Corning has developed recommended insulation standards for new construction based on a comprehensive computer analysis of 71 cities. Such factors as insulation costs, weather data, energy costs, and projected utility rates were a part of this analysis. The notebook provided contains specific zone information as well as projected cost and savings data for typical cities within each zone.

In support of this last point, Owens-Corning's quarterly market research determined that a total of 8 million homes added attic insulation during 1974, 1975, and 1976. That's an average of 2.7 million homes per year in a period when no legislation or tax incentives existed.

As of December 31, 1976, our research showed that 21.1 million owner-occupied homes with accessible attics had less than 6 inches of

attic insulation. Owner-occupied units are about 59 percent of the current occupied housing.

Our most recent survey shows that of these homes, 1.2 million voluntarily added attic insulation during the first quarter of 1977. On an annualized basis, that would represent a reinsulation rate of 4.8 million homes, up sharply from the 2.7 million annual rate of the past 3 years. The survey also found that some 6.3 million homeowners intend to insulate within the next 12 months.

The number of new housing starts has varied significantly since 1967, amounting to almost 1.6 million units that year, reaching a peak of over 3 million units in 1972, and dropping to about 1.4 million units in 1975. This year the Townsend-Greenspan organization forecasts about 2.2 million starts.

The volatile nature of this new construction market results in marked fluctuations in insulation demand and in production.

Recognizing that energy would increase in price, Owens-Corning has promoted energy conservation for many years and we have planned our capacity expansions accordingly.

Since 1971, we have doubled insulation manufacturing capacity through new production facilities and through process improvements which increase the output of existing equipment. Additional planned increases during the next 7 years will bring our residential and mobile home insulation capacity from a current 1.3 billion pounds to over 2 billion pounds by 1984. We have immediate plans to add 400 million pounds of residential insulation capacity by 1979.

A brief comment about insulation pricing. Our objective has been and continues to be a fair and equitable pricing. Over the years, our insulation prices have closely paralleled changes in the wholesale price index. Pricing is affected by numerous cost elements, including the cost of energy. The pressure for increases continues to be from inflation and rising energy costs. We foresee no unusual pricing changes, but we do foresee continuing pressure from these two sources.

In summary, there are three points I would like to leave with the committee. A strong reinsulation movement has been and is taking place. It is clear evidence of the public's interest in voluntary energy conservation.

Insulation standards should be implemented now so that major reinsulation programs need not be duplicated in a few years, this includes standards for both existing and new rental and owner-occupied housing.

Demand for insulation continues to be both seasonal and cyclical. Due to the many variables it is difficult to predict precisely what the levels of insulation demand may be during the next decade. However, it is Owens-Corning's feeling that the industry can provide material to handle the demand for both new construction and the retrofit market, including increased standards, provided that this task is implemented over a 7- to 10-year period.

[The prepared statement of Mr. Mabry follows:]

STATEMENT OF GUY O. MABRY, VICE PRESIDENT, INSULATION OPERATING DIVISION, OWENS-CORNING FIBERGLAS CORP.

My name is Guy O. Mabry, vice president of the insulation operating division of Owens-Corning Corporation. Accompanying me this morning is Mr. Brad Oelman, director of national affairs for our company.

I have served as chairman of the national council for the housing industry—an organization affiliated with the national association of home builders—and currently I am on the policy advisory board of the Harvard/M.I.T. joint center for urban affairs.

Owens-Corning, since it was incorporated in 1938, has been a leader in the development and manufacture of insulation and insulation systems.

This committee has been provided with a notebook which deals in detail with much of the research on which my statement is based. In the next few minutes, I will comment briefly on:

Proper minimum standards for achieving residential energy efficiency both in new construction and in existing homes;

The reinsulation trend in existing homes;

Factors affecting demand, current and projected capacity, pricing procedures; and,

The role of utilities in promoting residential conservation.

STANDARDS

First, the subject of insulation standards. A critical factor in either new construction or in a retrofit program involves setting the proper minimum standards for insulation levels and installation.

As background, I should explain that insulation performance is measured in R-values. The "R" stands for thermal resistance to heat—the higher the R, the better the insulating value of that material. Measuring insulation materials in inches is imprecise. For example, it requires 8¾ inches of glass fiber loose fill insulation to equal the thermal performance of 6 inches of glass fiber batt insulation. Similarly, R-values vary among insulating materials such as rockwool, cellulose, foam or any of the many other types which are on the market.

These variations among insulating materials must be taken into consideration in determining insulation standards for thermal performance, product safety and quality. In addition to the proper R-value, standards must also deal with the method and quality of installing insulation so that homeowners are assured of proper thermal performance.

Glass fiber blanket or batt insulation is factory produced to a certain density, thickness and thermal resistance. The National Association of Home Builders Research Foundation certifies that the performance of blanket-type insulation meets or exceeds the R value stated on the package.

In contrast, the R-value achieved by loose fill or pneumatically blown insulation depends upon the quality of installation. This variable creates a greater potential for exploitation of the consumer, regardless of the type of insulation material used. Consideration should be given to establishing an inspection procedure which would certify for the homeowner the quality of the installation performed.

At present, there are significant differences among the various insulation standards being recommended to homeowners. FHA minimum standards are lower than those recommended by the Farmers Home Administration, the National Bureau of Standards and the Edison Electric Institute. The administration's proposed "national energy plan" does not define specific insulation standards.

Owens-Corning has developed recommended insulation standards for new construction based on a comprehensive computer analysis of 71 cities. Such factors as insulation costs, weather data, energy costs and projected utility rates were a part of this analysis. The notebook provided contains specific zone information as well as projected cost and savings data for typical cities within each zone.

In most instances, the annual savings in heating and cooling costs from reinsulating is greater than the rebate proposed under the energy tax credit plan. While the rebate is an additional incentive, the year-after-year savings on utility bills has constituted an incentive of growing significance.

REINSULATION TRENDS

In support of this last point, Owens-Corning's quarterly market research determined that a total of 8 million homes added attic insulation during 1974, 75 and 76. That's an average of 2.7 million homes per year in a period when no legislation or tax incentive existed. As of December 31, 1976, our research showed that 21.1 million owner occupied homes with accesible attics had less than 6 inches of attic insulation. Owner occupied units will be about 59% of the current occupied housing in place.

Our most recent survey shows that of these homes, 1.2 million voluntarily added attic insulation during the first quarter of 1977. On an annualized basis, that would represent a reinsulation rate of 4.8 million homes, up sharply from the 2.7 million annual rate of the past three years. The survey also found that some 6.3 million homeowners intend to insulate within the next 12 months.

The proposed legislation should strive to continue the voluntary reinsulation momentum among do-it-yourselfers. At the same time, the reinsulation of American homes must be managed over a 7 to 10 year period in order to avoid a sudden demand surge in the market place, a condition that could produce economic dislocations.

DEMAND/CAPACITY

As indicated, insulation standards will have an important effect in determining future demand for insulation. Demand is also affected by the level of new residential construction.

The number of new housing starts has varied significantly since 1967, amounting to almost 1.6 million units that year, reaching a peak of over 3 million units in 1972 and dropping to about 1.4 million units in 1975. This year the Townsend-Greenspan organization forecasts about 2.2 million starts.

The volatile nature of this new construction market results in marked fluctuations in insulation demand and in production.

Concurrently, the amount of insulation per housing unit has been increasing—from 502 pounds per home in 1967 to 721 pounds per home in 1976. In the mobile home industry, the trend has been even more dramatic—from an average of 200 pounds of insulation per new unit in 1967 to over 600 pounds in 1976. These per unit increases reflect that builders are responding to the need for energy efficiency and that many new homes are being designed to conserve energy. They also magnify the impact on production of the year to year fluctuating in housing starts.

Recognizing that energy would increase in price, Owens-Corning has promoted energy conservation for many years and we have planned our capacity expansions accordingly. Since 1971, we have doubled insulation manufacturing capacity through new production facilities and through process improvements which increase the output of existing equipment. Additional planned increases during the next seven years will bring our residential and mobile home insulation capacity from a current 1.3 billion pounds to over 2.0 billion pounds by 1984.

Further capacity increases, if required, can be accomplished with provision for reasonable lead time. In the past 8 years, there have been only two years—1972 and 1973—when Owens-Corning fully utilized its existing capacity. These were both years when housing starts were high.

Our forecasts of demand and capacity are based on certain critical assumptions—the level of new housing starts; the reinsulation rate, with the major portion of that reinsulation being done with batt-type insulation by do-it-yourselfers; and the acceptance of reasonable standards, together with orderly progress towards the attainment of those standards. None of these assumptions is subject to our control.

Through the first five months of the year, Owens-Corning has delivered 60 percent more insulation than in the same period last year, and during the month of May, we shipped twice the quantity required of us during May 1976. Nevertheless, our loose fill insulation is currently in short supply in several parts of the country and we expect this situation to continue for the immediate future. We have instituted a program which allows for equitable distribution of available products according to a customer's level of purchases during the past year.

Owens-Corning's other form of residential insulation—namely batt or blanket insulation—is generally more available, although this too varies periodically from region to region. Owens-Corning is only one insulation manufacturer. A number of insulation producers have recently added capacity and announced expansion plans, some of considerable magnitude. We believe that the demand for insulation materials can be met.

In discussing manufacturing capacity additions, the impact of environmental regulations and energy availability constitute significant considerations. Current environmental law, together with EPA's trade-off policy for industrial growth in non-attainment areas, places serious constraints on a company's ability to increase production capacity to meet further market demands. Companies who have already achieved a substantial reduction of their emissions have little, if anything, left to trade off.

In the case of energy availability, despite extensive programs to use alternate fuels at all of our plants, several portions of the glass fiber insulation process require natural gas and cannot be converted to alternate sources of fuel. Energy availability, particularly of natural gas in these nonsubstitutable areas, is a critical factor in operating existing facilities or in establishing new capacity.

A brief comment about insulation pricing. Our objective has been and continues to be a fair and equitable pricing. Over the years changes in prices have closely paralleled changes in the wholesale price index. Pricing is affected by numerous cost elements, including the cost of energy. The pressure for increases continues to be from inflation and rising energy costs. We foresee no unusual pricing changes, but we do foresee continuing pressure from these two sources.

UTILITY PROGRAMS

I would like to comment about the role of utilities in promoting proper insulation. Utilities are in a good position to encourage residential energy efficiency and proper insulation, both in new home construction and in existing houses. Many utilities have metering programs underway which measure energy savings of various insulation levels, as well as other energy conserving systems or products. Other utilities have established energy efficiency standards for new home construction. There are also a number of effective and innovative utility programs which promote energy conservation through advertising, bill stuffers or other communication channels. Still other utilities offer their customers the opportunity to finance energy improvements.

Utility programs such as those discussed here are appropriate and constructive activities. However, we do have serious reservations about mandatory conservation programs which would require utilities to install and pay for certain conservation devices in the homes of customers, and then incorporate the cost of these improvements into the rate base. Such mandatory installation by utilities could severely disrupt existing distribution channels, in addition, those who have already insulated would be inequitably treated.

In summary, there are three points I would like to leave with the committee:

A strong reinsulation movement has been and is taking place. It is clear evidence of the public's interest in voluntary energy conservation.

Insulation standards should be implemented now so that major reinsulation programs need not be duplicated in a few years, this includes standards for both existing and new rental and owner-occupied housing.

Demand for insulation continues to be both seasonal and cyclical. Due to the many variables, it is difficult to predict precisely what the levels of insulation demand may be during the next decade. However, it is Owens-Corning's feeling that the industry can provide material to handle the demand for both new construction and the retrofit market, including increased standards, provided that this task is implemented over a 7 to 10 year period.

Mr. Chairman, we appreciate this opportunity to place our comments before you and we hope that Owens-Corning can be of further assistance to your committee as the deliberations proceed.

I am available to answer any questions you have.

Senator JOHNSTON. Mr. Koach.

STATEMENT OF JOSEPH L. KOACH, EXECUTIVE VICE PRESIDENT, NATIONAL INSULATION CONTRACTORS ASSOCIATION, INC., ACCOMPANIED BY WALTER SHIPE, VICE PRESIDENT, ASBESTOS COVERING & ROOFING CO., AND CHAIRMAN, GOVERNMENT RELATIONS COMMITTEE, NATIONAL INSULATION CONTRACTORS ASSOCIATION

Mr. KOACH. Mr. Chairman, I have with me Walter Shipe, who is the chairman of our Government Relations Committee. I thought the deliberations of the committee would be better served by having a contractor who is doing this every day.

Senator JOHNSTON. We will read the statement. We are so pressed for time, we would like you to summarize if you could.

Mr. SHIPE. I am an independent insulation contractor, a small businessman and a member of the National Insulation Contractors Association, NICA. The bulk of NICA members' work is conducted in the commercial and industrial sectors of the construction industry, by far the heaviest users of energy resources.

Our projects include insulation for ships, office buildings, and manufacturing, petrochemical and power generating plants. A key concept of the national energy policy is to achieve enormous savings in fuel and power use through retrofitting of industrial and commercial buildings.

We are involved in this effort by insulating to make cooling and heating and industrial process and power systems more energy efficient.

This hearing has extraordinary significance for the industrial and commercial insulation contractor. NICA's membership includes hundreds of insulation contractors nationwide who serve an industrial, commercial, and utility market that accounts for approximately 42 percent of this country's energy consumption.

Whether these enterprises will make the investment necessary to save 30 percent or more of fuel and electricity outlays by retrofitting factories, refineries, power generating plants, and office buildings, depends heavily on the final form of S. 1469 and the administrative policies of the Federal Government in furthering energy conservation measures.

Our organization has been committed for some time to what President Carter calls the moral equivalent of war in helping make this country energy independent. One of your colleagues, the senior Senator from New Mexico, expressed similar convictions 13 months ago. Speaking at a world congress on industrial insulation in Stresa, Italy, Senator Domenici cited up to the minute FEA data showing the equivalent of 3.5 billion barrels of petroleum could be saved over a period of years by a massive effort to insulate and retrofit industrial buildings.

Senator Domenici correctly noted Americans were unconvinced at this time a year ago of the severity of the energy crisis, preference for larger cars and demand for fuel amounted to business as usual or to the feeling that inflation would run costs of motor vehicles and other needs to constantly increasing levels.

In speaking for NICA, we would emphasize that the national energy plan has given the industrial and commercial sector of the energy program relatively scant attention, in contrast to that of the homeowner and the insulation of homes.

S. 1469, as originally proposed, makes much of inducements for Americans to make their homes more energy efficient through solar heating and cooling and insulation. It should be made abundantly clear that American use of energy for homes amounts to only 20 percent of national consumption. This is less than half of the 42 percent that is consumed by the industrial and commercial sector.

The problem in our market can be summed up in these terms: owners and investors of industrial, commercial, and utility buildings have insufficient incentive to make the investment in retrofitting buildings and plants to achieve up to 30 percent or more in energy savings.

We submit, for the record, indepth data on the precise gains in energy efficiency and savings to be achieved by industrial insulation. The specifications for such retrofitting and recycling of buildings in accord-

ance with $13 a barrel of oil are based on guidelines of the National Bureau of Standards.

The administration's energy package, while recognizing the benefits of such investment would provide a mere additional 10 percent in business tax credits for such essential national interest energy conservation investments. We have presented our brief for more reasonable treatment of such investment to the House Ways and Means Committee.

We have the product to do the job, we think we can save this country a tremendous amount of money, but the 10 percent credit, whether a tax credit or investment credit, is not enough when you are talking about the payback period of anywhere from 6 months to 5 years. People are not going to invest the money to do the job we think we can do. The insulation will pay for itself. We have the backup to prove it.

Senator JOHNSTON. Would you rather have a loan guarantee?

Mr. SHIPE. No. Well, I don't know, I can't speak for American business, what their thoughts are. We have heard a lot of manufacturing companies. They are not interested in making the money available. It is not going to be a paycheck in 2 years. They are not interested in spending that kind of money.

[The prepared statement of Mr. Shipe follows:]

STATEMENT OF WALTER SHIPE, VICE PRESIDENT, ASBESTOS COVERING & ROOFING CO., BELTSVILLE, MD., AND CHAIRMAN, GOVERNMENT RELATIONS COMMITTEE, NATIONAL INSULATION CONTRACTORS ASSOCIATION

My name is Walter Shipe. I am an independent insulation contractor, a small businessman and a member of the National Insulation Contractors Association (N.I.C.A.). The bulk of NICA members' work is conducted in the commercial and industrial sectors of the construction industry—by far the heaviest users of energy resources. Our projects include insulation for ships, office buildings and manufacturing, petrochemical and power-generating plants. A key concept of the National Energy Policy is to achieve enormous savings in fuel and power use through retrofitting of industrial and commercial buildings. We are involved in this effort by insulating to make cooling and heating and industrial process and power systems more energy-efficient.

Accompanying me is Joseph L. Koach, Executive Vice President of the National Insulation Contractors Association.

This hearing has extraordinary significance for the industrial and commercial insulation contractor. NICA's membership includes hundreds of insulation contractors nationwide who serve an industrial, commercial and utility market that accounts for approximately 42% of this country's energy consumption. Whether these enterprises will make the investment necessary to save 30% or more of fuel and electricity outlays by retrofitting factories, refineries, power-generating plants and office buildings, depends heavily on the final form of S. 1469 and the administrative policies of the Federal Government in furthering energy conservation measures.

Our organization has been committed for some time to what President Carter calls the moral equivalent of war in helping make this country energy-independent. One of your colleagues, the senior Senator from New Mexico, expressed similar convictions 13 months ago. Speaking at a World Congress Industrial Insulation in Stresa, Italy, Senator Domenici cited up-to-the-minute FEA data showing the equivanlent of 3.5 billion barrels of petroleum could be saved over a period of years by a massive effort to insulate and retrofit industrial buildings.

Senator Domenici correctly noted Americans were unconvinced at this time a year ago of the severity of the energy crisis—preference for larger cars and demand for fuel amounted to business as usual or to the feeling that inflation would run costs of motor vehicles and other needs to constantly increasing levels.

In speaking for NICA, we would emphasize that the National Energy Plan has given the industrial and commercial sector of the energy program relatively

scant attention, in contrast to that of the homeowner and the insulation of homes. S. 1469 as originally proposed makes much of inducements for Americans to make their homes more energy efficient through solar heating and cooling and insulation. It should be made abundantly clear that American use of energy for homes amounts to only 20% of national consumption. This is less than half of the 42% that is consumed by the industrial and commercial sector.

The problem in our market can be summed up in these terms: owners and investors of industrial, commercial and utility buildings have insufficient incentive to make the investment in retrofitting buildings and plants to achieve up to 30% or more in energy savings. We submit, for the record, in depth data on the precise gains in energy efficiency and savings to be achieved by industrial insulation. The specifications for such retrofitting and recycling of buildings in accordance with $13 dollars a barrel of oil, are based on guidelines of the National Bureau of Standards. The Administration's energy package, while recognizing the benefits of such investment would provide a mere additional 10% in business tax credits for such essential national-interest energy conservation investments. We have presented our brief for more reasonable treatment of such investment to the House Ways and Means Committee.

In seeking your subcommittee's recognition we believe you can ensure that national conservation policy will give priority to our role in generating vast energy savings in the 1980s to the mid-90s. The legislative history being made in this session of the 95th Congress should guide the Department of Energy and other agencies in coping with any shortages of raw materials for insulation and other building products. Business and industrial management needs the flexibility to upgrade the efficiency of their facilities.

As the National Energy Plan notes, many industries in this country stepped up the insulation of buildings as a result of the 1973–74 Arab oil boycott and the crisis of the 1976–77 winter. However, a number of U.S. companies have not achieved the economies that their foreign counterparts, particularly in West Germany, have shown. For example, West German plants used 38% less energy per unit of output in 1975 and 1976 than the same type of enterprise in this country. Moreover, the bulk of the effort in the U.S. over the past three years has been in traditional cost-cutting by more vigilant use of electricity. Only a few major enterprises have scored tremendous gains through the kind of retrofitting of buildings that our industry provides.

We would add that insulation contractors require large numbers of skilled construction workers to carry out the renovations that building owners need to meet national goals, as set forth in the legislation now being considered. The development of the insulation industry, the availability of financing, and the overall contribution to long-term energy conservation will depend on the Congress's final action in adopting policies and programs responsive to these needs.

I am including, for the record, additional support data which your committee may find useful.

On behalf of the National Insulation Contractors Association, I want to thank you for this opportunity to testify on this important matter. I will be glad to answer your questions.

EXAMPLE CALCULATION OF ENERGY SAVINGS

10" Pipe at 700° F for 8760 Hour/Year.
Calcium Silicate Insulation.
1,000 Linear Feet of Pipe.

	Btu heat loss/1,000 ft/h	Fuel oil used (gallons per year)	Multiplied by	Cost per year
Thickness of insulation:				
0	10,200,000 × 8,760 h/yr (68 gph)	595, 680	0.32	$190, 620
1 in	672,000 × 8,760 h/yr (4.5 gph)	39, 420	.32	12, 615
1½ in	511,000 × 8,760 h/yr (3.4 gph)	29, 960	.32	9, 590
2 in	417,000 × 8,760 h/yr (2.8 gph)	24, 530	.32	7, 850
2½ in	356,000 × 8,760 h/yr (2.3 gph)	20, 935	.32	6, 700
3 in	313,000 × 8,760 h/yr (2.1 gph)	18, 395	.32	5, 890

Fuel Costs @ #6 oil @ 149,000 BTU/gallon @ 7.8¢/gallon = $13.50/Barrel or 2.16 MBTU.

FUEL COST CALCULATION

#6 Oil @ $13.50 for Barrel (42 gallons) @ 149,000 BTU/gallon = 32¢/gallon × 6.7 = 2.15 MBTU (Operation is 8,760 hours per year).

SAVINGS OF 3.5 BILLION BARRELS OF OIL POSSIBLE FROM INDUSTRIAL INSULATION

Improved insulation design applications in U.S. industrial plants could save 3.5 billion barrels of oil between now and 1990, says a study made for the Federal Energy Administration.

The study estimates further that more than 122 million barrels of oil could have been saved in 1974 if the industrial sector had made optimum use of economic insulation techniques.

These savings are reported in a 191-page manual, "Economic Thickness for Industrial Insulation," made available by FEA today. The manual was prepared for FEA by York Research Corporation of Stamford, Connecticut.

"U.S. industrial plants and utilities account for more than 50 percent of the Nation's energy consumption," said FEA Administrator Frank G. Zarb. "The conservation of energy through the use of optimal economic insulation thickness has obvious benefits for industry, and equally impressive potential benefits for the U.S. We believe that this design manual will serve as a practical working document in assisting industrial managers and plant engineers to plan and install effective insulation systems at the lowest possible cost."

The economic thickness manual, developed specifically for the industrial user, will permit companies without extensive engineering capabilities and computer facilities to easily calculate optimal economic insulation use, FEA said. Economic insulation is defined as that thickness providing "the lowest total cost of lost energy and insulation investment over the project life."

The manual is expected to be particularly useful to architects and specifying engineers in designing new inndustrial construction, utilizing least-cost insulation thickness criteria based on minimum life-cycle costs.

Comprised of 8 chapters, the manual discusses in detail such topics including the economics and costs of insulation, cost of energy, economic thickness determination, condensation control, retrofitting insulation, and sample problems. Also included in the manual is a bibliography, tables, illustrations, and appendices.

Two major industry trade associations, the National Insulation Contractors Association, and the Thermal Insulation Manufacturers Association, and a number of their member companies, provided invaluable assistance to FEA and the York Research Corporation in the development of the manual.

Copies of the *Economic Thickness for Industrial Insulation Manual* are available for purchase from: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402: Price $2.70; Stock No. 041–018–00115–8.

FEA is also producing a 25-minute, 16mm color film on economic thickness for industrial insulation, suitable for use at seminars and workshops for industrial plant managers and other industry officials. Copies of this film will be available for sale, rental and short-term loan. A ¾" color videotape cassette version will also be available. The film is expected to be completed by mid-December. Film inquiries should be directed to: Federal Energy Administration, Office Conservation and Environment, Washington, D.C. 20461.

STATEMENT OF L. A. BARRON, MANAGING DIRECTOR, NATIONAL CELLULOSE INSULATION MANUFACTURERS ASSOCIATION

Mr. BARRON. Good morning, Mr. Chairman and members of the committee. On May 10, 1977, Mr. Nile V. Bucher, president of Incel Corp. of Bluffton, Ind., entered into the record of the House Subcommittee on Energy and Power, a statement setting forth his views, as a cellulosic insulation manufacturer on proposed energy legislation quite similar to that being addressed today.

While Mr. Bucher testified as president of his company, he is also president of National Cellulose Insulation Manufacturers Association, Inc. Therefore, his views have the added impact of being the

basic premise of NCIMA. My views, stated following, are supplemental to Mr. Bucher's.

It is noted that section 102 of the proposed legislation says that the Administrator shall, within a time frame of 120 days after enactment of this subpart, promulgate rules for the control and implementation of residential energy conservation plans which may include standards for general safety and effectiveness of any suggested measure.

Three areas of standards do now exist that address the physical characteristics required of cellulosis insulation. The General Services Administration promulgates HH–I–515C to be used for the purchase of cellulosic insulation in the Federal sector, the American Society for Testing and Materials has developed, in that Society's consensus standards writing process, the specification identified as ASTM C–739 on cellulosic insulation. Our association, NCIMA, has implemented its specification on cellulosic insulation identified as N–101.

These three specifications are, in essence, comparable, but we feel that the N–101 is somewhat more rigid. We have recently, however, on the ASTM level, been able to tighten up the C–739 specification which if accepted by the society, American Society for Testing and Materials that is, in balloting due in August 1977, will give the industry an improved standard with which to work.

Additionally, the industry is now working with the General Services Administration toward the issuance of a revision to the Federal specification HH–I–515C to be issued, I understand, in January 1978.

Any one of these specifications with adjustments such as those now underway, are worthy of endorsement by the Federal Government. I would not recommend the development of a totally new standard.

The committee, I feel sure, will examine these standards and consider the language that establishes the benchmarks for cellulosic insulation, particularly in the area of flame spread. In an appeal to fairness, I would ask you to examine also the specifications covering other types of thermal insulation, particularly in the area of flame spread of vapor barriers so commonly used.

As a final comment on this portion, the committee is urged to examine the energy intensiveness of the manufacture of each one of the thermal insulations generally used in the residential market.

The implementation of a program to conserve energy in schools and hospitals is worthy indeed. However, care should be taken to assure that all thermal insulations will be permitted to compete in these market areas.

The achievement of the goals set forth in the proposed legislation will require the intelligent integration of all thermal insulating materials made in our country to get the job done. Exclusionary ordinances should not be implemented which reduce the competitiveness of the marketplace.

NCIMA commends the committee for this indepth discussion of the problem and is grateful for the opportunity to participate in the dialog. NCIMA and its affiliated companies would welcome the opportunity to participate in refining of the aforementioned standards and in aiding the achievement of he goals set forth.

Senator JOHNSTON. Should we have Federal cellulose standards?

Mr. BARRON. I think a federally recognized standard in all of the 50 States, uniform standards, be implemented all across this Nation of

ours rather than permitting local adjustment so we are all working against a basic data.

Senator JOHNSTON. We should have Federal standards in all areas?

Mr. BARRON. All areas, whether it is cellulose fiber or what have you.

Senator JOHNSTON. What has the price of cellulose done in the past few years? I direct that generally to the panel.

Mr. BARRON. I cannot speak to that, Mr. Chairman, I am a trade-association type.

Mr. MABRY. As I testified, ours has followed the wholesale price index since about 1970. It was in the testimony and notebook provided to the committee. There is a chart on our own pricing.

Senator JOHNSTON. What kind of pricing do you foresee if the Carter program is implemented?

Mr. MABRY. The only ones we foresee are those that would be generated by our own higher costs. These may be reflected from our own higher energy costs and other raw material increases. We only foresee increases that would cover cost increases and allow us to generate sufficient profits to add capacity. We need this profit level at a minimum so we can afford to add capacity.

Senator JOHNSTON. Do I take it then your industry can expand output in almost unlimited percentages very quickly?

Mr. MABRY. No; it would take probably between 18 to 36 months; 18 months would probably be an existing plant, 36 months at a new plant. That could be shortened if we could find ways to streamline all of the administration details, the licenses, and so forth, particularly those promulgated by environmental controls. If there were some shortcut there, we could beat the 36 months.

Senator JOHNSTON. What would your supply curve look like during that 36 months?

Mr. MABRY. During the 36 months our supply curve would only be increased in relation to our existing plants. Any product changes or increased throughputs would increase supply slightly. A new plant would not go onstream, so to speak, until it was fully completed. At that point, we would reach a high production level in a short period of time.

We are adding to our capacity right now at our existing plants. Some of this capacity will come onstream, for instance, in August of this year, in an Ohio plant. In addition, we plan on adding new lines during the next 2½ years.

Senator JOHNSTON. Will there be sufficient insulation to be available to meet these goals we are talking about? Can you expand in 36 months to fully meet these goals?

Mr. MABRY. I think in my statement we address that. Yes, as far as we are concerned, the industry can support increased demand. If housing starts remain high, the retrofit program, and higher minimum insulation standards are put in place, this would create a very high demand. Because of the 18 to 36 months timelag, I don't think the industry could respond to meet the demand in the near term.

Senator JOHNSTON. Would you rather have a tax credit or a Government-guaranteed loan?

Mr. MABRY. A Government-guaranteed loan to whom?

Senator JOHNSTON. For the homeowner.

Mr. MABRY. I really don't know. Some type of incentive is probably necessary, but not so much to the owner-occupied home, because many homeowners have already reinsulated their attics.

The rental market, the very low income, is where the real incentive is needed in order to get the job done.

Senator JOHNSTON. It just seems to me we ought to look into the question of Government-guaranteed loans, say 90 percent guaranteed. I think that would be more useful to the homeowner and just as cheap to the Federal Government, maybe cheaper than a tax credit.

You guarantee that loan, say 90 percent, you still have 10 percent to insure some participation and discrimination in the lender. You would be able to give that note then to the utility company to reflect on its bill. But if they did not pay, you avoid that problem of cutting off the service.

You then go back to whatever the enforcement agency is to foreclose through ordinary processes. You would not require a mortgage as you would have to have. I am sure the insulating contractor would not give a loan without some kind of security. Am I right on that, Mr. Shipe?

Mr. SHIPE. Right.

Senator JOHNSTON. If you have $5,000 on insulation, you are not going to just put that on account. You would require some kind of security.

Mr. SHIPE. Yes.

Senator JOHNSTON. Usually that would be a second mortgage.

Mr. SHIPE. We have bank financing available now. People can get loans. Utilities like Washington Gas Light Co. and Baltimore Gas & Electric Co., do it, but they are using independent insulation contractors to get the work done. That is the point.

Senator JOHNSTON. What are the size of these insulation contracts?

Mr. SHIPE. Anywhere from $200 to $400, if you add storm windows and other energy conservation measures, then that runs up the cost.

Senator JOHNSTON. They are doing it on a voluntary basis, they are putting it on their bill?

Mr. SHIPE. Some utilities, yes.

Senator JOHNSTON. They would cut them off if they don't pay.

Mr. SHIPE. I think that is their position.

Senator JOHNSTON. They have plenty of security there and the amount is fairly small; $200 to $400, that is not much of a retrofit job of the average home.

Mr. SHIPE. I am talking about the average house.

Senator JOHNSTON. What does it cost to retrofit the average home? I will let you define the average home.

Mr. SHIPE. The average home would run about $300, $350, somewhere in that area.

Senator JOHNSTON. Is that all? What do you get for that? What do you get for $350?

Mr. SHIPE. You get more attic insulation. We go out and give estimates.

Senator JOHNSTON. You are talking about attic insulation?

Mr. SHIPE. Attic insulation primarily.

Senator JOHNSTON. You can't get much more than attic insulation for $350, can you?

Mr. SHIPE. No; no sense in putting in more than you need. This is where it has to be engineered, it has to be sold properly.

Senator JOHNSTON. Gentlemen, we have run 10 minutes over. I want to apologize to this panel and everyone else for not having full time to develop your testimony, but your testimony will be fully read and we will have some written questions to you. Thank you very much.

We will recess until tomorrow.

[Whereupon, at 10:10 a.m., the hearing was recessed, to reconvene Wednesday, June 22, 1977, at 7 a.m.]

93-653—78——13

ENERGY CONSERVATION PROVISION OF PRESIDENT CARTER'S ENERGY PROGRAM

(Parts A, B, C, and G of S. 1469)

WEDNESDAY, JUNE 22, 1977

U.S. SENATE,
SUBCOMMITTEE ON ENERGY CONSERVATION AND REGULATION,
OF THE COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, D.C.

The subcommittee met, pursuant to notice, at 7 a.m., in room 3110, Dirksen Office Building, Hon. Henry M. Jackson, chairman, presiding.

Present: Senators Jackson, Johnston, Metzenbaum, Weicker, and Domenici.

Also present: Benjamin S. Cooper, professional staff member, and James T. Bruce, counsel.

OPENING STATEMENT OF HON. HENRY M. JACKSON, A U.S. SENATOR FROM THE STATE OF WASHINGTON

The CHAIRMAN. The committee will come to order. Senator Johnston will be here a little later. Senator Johnston is chairman of the Subcommittee on Energy Conservation and Regulation. I shall read his opening statement:

For those who are wondering why we are again beginning at daybreak, the answer is quite simple. Our committee hopes to report this and other parts of S. 1469 by the August recess. We have an extremely tight schedule. I want to thank our witnesses and our audience for indulging the committee in the necessity of extracting as much useful work as possible out of these two days.

Today we will continue our consideration of four parts of S. 1469, the nontax provisions of President Carter's energy package. Part A is the utility program for encouraging the weatherization of existing residential homes. Part B would require the promulgation of mandatory energy efficiency standards for consumer products. Part C would offer grants to modify schools and hospitals to reduce their energy consumption. In this regard we will also consider the provisions of S. 701, the Emergency Education Assistance Act, sponsored by Senator Pell. Finally, Part G, "Federal Energy Initiatives," provides for a Federal vanpooling program and the demonstration of solar heating and cooling in Federal buildings.

As you know, the various House subcommittees handling the President's energy proposals have made numerous and significant changes. However, this subcommittee will, as we did yesterday, direct our primary attention on the President's original energy legislation. Nevertheless, we encourage our witnesses to refer to the House versions of these proposals as they wish.

As you can see from the witness list, we have structured our hearings in a series of panels, each of which consists of witnesses addressing generally the same issues among the Carter proposals. Therefore, as we proceed we will consider all four parts of S. 1469.

The first panel today consists of representatives of the natural gas utilities, the electric utilities and the fuel oil dealers of the Northeastern United States.

Gentlemen, I don't know in which order you wish to proceed. Mr. Loberg, are you to be first?

Mr. LOBERG. That will be fine.

The CHAIRMAN. We will take all of the statements and then we will go to the questions. If you wish, because some statements are rather long, the entire statement could go in the record. If you could, you can hit the highlights if you wish and save some time.

STATEMENT OF THOMAS J. LOBERG, DIRECTOR OF MARKETING SERVICES, AMERICAN GAS ASSOCIATION

Mr. LOBERG. I am Thomas J. Loberg, director of marketing services for the American Gas Association testifying on behalf of AGA which is composed of 300 member companies furnishing natural gas distribution and transmission services to over 160 million consumers in all 50 States.

AGA member companies provide approximately 85 percent of the Nation's natural gas utility sales. Natural gas alone supplies 43 percent of the primary energy consumed by residential and commercial establishments and over 40 percent of the energy used by U.S. industry.

Our major concern with the utility conservation program provisions of the National Energy Act, S. 1469, is the federally mandated program it establishes. This legislation can be improved to more effectively meet the goal of conserving more natural gas supplies. AGA recommends instead of mandating such a Federal program, a voluntary program should be established at the State level by the State public utility commissions who are more familiar with the economic, supply, baseload pattern, and climatological considerations inherent in such a program. State PUC's are also better equipped to review ratemaking considerations for utility conservation programs.

We recommend this approach because a State program under the auspices of the state PUC is more efficient since it would eliminate the need for a second tier of Federal implementing regulations and would minimize Federal involvement in an area of proper State concern.

Finally, the free enterprise system is already at work providing thermal retrofit services to consumers. In some cases there already exist plans that are being effectively implemented. Abrogating such plans could be counterproductive and could impede further development of necessary conservation services to consumers.

Gas utility activities in marketing attic insulation have increased dramatically in the past 2 years on a voluntary basis along with interest in other conservation devices such as wall insulation and clock thermostats.

This shows the marketplace can work in conjunction with a sense of public utility responsibility and State PUC cooperation to achieve desirable results without the restrictive, unnecessary, federally mandated framework established in this bill.

It is interesting today in Chicago, there is a third retrofit seminar which is being conducted by AGA and which is attended by over 90 utilities. This activity has been ongoing for the past 5 years.

The national energy plan establishes the goal of insulating 90 percent of all residences by 1985. Using the plan's estimate of 74 million residences, the University of Texas, in a recent study, estimated the gross cost of installation of energy conservation measures in the range of $53.3 to $146.5 billion. This range reflects average costs of installation running from a low of $800 per residence to a high of $2,200. Further, the cost of borrowed capital ranges from $23.9 billion to $67.5 billion.

Mandatory utility financing of energy conservation programs would impose serious investment burdens upon the gas utility industry. Gas supply requirements, independent of conservation savings, dictates that the industry must engage in a massive capital program during the next 10 years.

We anticipate capital expenditure requirements of $66 billion, in terms of 1975 constant dollars, by the mid-1980's, which compares to the industry's gross plant of $50 billion at the beginning of 1976. Additional capital requirements to support financing of energy conservation programs could seriously undermine the financial integrity of the industry, force dangerous delays in vital conventional and supplemental supply projects, and obstruct the ability to maintain current utility operations.

Some AGA member companies have estimated that the capital requirements to support financing of energy conservation programs within their service area range from $500 million to $1 billion, a figure that, in many instances, exceeds their total investment in existing plant.

Further, there are serious problems in raising these amounts in conventional money markets because of problems in the area of collateral pledged to secure this financing. The utility would not own the materials installed nor the residential structure itself, and therefore, could not offer suitable collateral to secure the capital necessary to support the financing.

Installations of insulation on the property of utility customers would not meet the definition of "bondable property" because of limitations imposed by the particular State PUC or by particular indenture restrictions, in some instances.

Further, mandatory utility financing would subject the gas utility to the specter of increased debt collection programs at a time when the industry is coping with 25 to 35 percent increases in bad debt accounts for traditional utility service, as an outgrowth of this past harsh winter.

Most gas utilities are not structured to be in the business of determining who receives loans, handling partial payments on loans, coping with defaults, and handling enforcement actions. The Federal Government should allow the utilities and their State commissions to evaluate and determine the utilities role in such a program. Gas utilities should not be federally mandated into changing the basic nature of their business.

Finally, the prospect of rising wholesale and retail prices for insulation and retrofit devices raises the spectre of utilities having to cope with possible Federal controls or restraints on the prices of insulation and retrofit devices, or overcharging by contractors for services. This could lead to failure of contracts and increased administrative costs to utilities.

It is also unfair to those customers who have already insulated their homes and would have to help with the burden of insulating their neighbors' homes.

The definition of "residential energy conservation measure" which includes certain furnace efficiency modifications should be modified to reflect safety considerations associated with increasing combustion efficiency and modifying flue openings. AGA recommends the definition include furnace efficiency modifications to combustion efficiency and to flue openings when such modifications or retrofit devices are certified and the installers are properly trained.

Section 103 requires utilities to enter the retrofit installation business. While the gas industry supports the increased use of retrofits for conserving gas, there are serious problems in the proposals as stated.

Under section 103, utilities must list and sell all available retrofit products, whether tested or untested, safe or unsafe, and whether they save gas or not. To do otherwise would invite antitrust litigation on the part of retrofit manufacturers or even the Government. In addition, utilities would become the product liability insurers and guarantors of such devices when they are sold.

To prevent this unfair result, the legislation should specifically require the State regulatory commissions to compile lists of recommended devices and exempt utilities from the antitrust laws when acting pursuant to a mandated plan. Also, it should exempt utilities from product liability and other liability relating to their installation and use when such devices are not directly supplied by or installed by utilities.

There are also regulatory barriers to conservation programs. Section 107 removes contractual barriers to installing retrofit devices. In reality, the barriers are more regulatory than contractual. Therefore, this section should be broadened to provide an exemption from Federal and State regulation of utility company participation in retrofit and other conservation programs.

The portions of the bill that require suggested conservation measures, energy savings, and availability of arrangements should be limited to the specific utility providing heating service to the residential customers. This will maximize conservation efforts toward the major household consumer of fuel or energy, space heating.

Also, the information on energy savings provision should be modified to include only an estimated range of energy savings. Energy savings is an imprecise science at best that cannot take into account such subjective considerations as personal lifestyle and use patterns, which cannot be defined in reach an ultimate conclusion on energy savings to the customer.

AGA wants to make it clear that gas utilities do not want to be in the business of competing with contractors or with financial institutions for thermal retrofit services or conservation loan financing. The financing service provision of the bill should be modified so that the utility would be in a position to offer to refer customers for financing through: Conventional financing sources; Federal program sources; State program sources; or the utility's own financing program.

This would offer maximum financing flexibility for the customer and insure that a specific company was not forced into the consumer

financing business in which it may lack fundamental expertise and the necessary capital resources.

Also, the financing program amendments to the National Housing Act would classify a public utility as a financial institution or loan institution if it makes loans for energy-conserving home improvements.

This provision establishes a dangerous precedent with the added dimension of introducing a wide, new array of reporting requirements for utilities and potential compliance requirements with a wide variety of bankng laws. These increased costs of reporting and compliance would ultimately be borne by all customers.

AGA strongly recommends that utilities be exempt from any new regulatory reporting and compliance requirements of Federal, State and local laws, if classified as a financial or loan institution.

Finally, the service requirements in the bill would allow the borrower to repay the loan for a period of no less than 3 years. AGA believes this provision is unduly restrictive and recommends that the borrower have the right to voluntarily accelerate payment on the loan without incurring any penalty.

AGA commends and supports the provision in the bill permitting alternative installation programs since it provides needed flexibility to utilities already actively engaged in thermal retrofit programs. However, the requirements for alternative programs need further modification in two respects: The savings likely from the measure should be modified to an estimated range of energy savings, for reasons previously mentioned; the provision covering other requirements set by the Administrator is too open ended, and could effectively operate to limit development and progress of programs that are already underway, and programs that are more effective and more efficient.

Also, Federal regulations too often are ineffective at setting national average requirements. AGA recommends this provision be deleted from the bill or, in the alternative, be modified to include more specific provisions in the bill itself or in its legislative history.

Senator JOHNSTON [presiding]. Mr. Loberg, let me stop you at that point. Despite the fact we started this panel at 7, the whole panel has only until 7:45. We very carefully study these statements and we will get all of that. What we would like to do is have the opportunity in these hearings to have some give and take to make the major points so we can discuss them.

We can read the statement at our leisure and we want to have the time for give and take. Now, are you telling us you don't want to get in the retrofit business? You would rather not be in it?

Mr. LOBERG. Not at all. I mentioned earlier, in Chicago we are conducting our third annual retrofit seminar which is a third annual seminar bringing together the AGA member companies with those people in the business as a means of searching out the means of the state of the art and so forth.

We have been in the business of recommending voluntary conservation programs for a period of 6 years. What we are suggesting is the voluntary aspects of the conservation effort are far more significant and appropriate than mandating it and mandating the utilities perform it in a certain way.

The CHAIRMAN. With all due respect, a voluntary program is really not going to work. I have a bit of sensitivity for the utility end of this thing. You are the receiving end. You are the conveyor of bad news and I think the utilities are all in an unfair position in that the higher costs do not necessarily emanate from you, they pass through you.

There is a problem here with your having to carry out mandated orders. But without some kind of mandated program we are not going to get anywhere. We passed a nonmandatory conservation program here awhile back. The attitude of the public coming back and saying: Well, this is one of those phony conservation programs that does not mean anything, it is nonmandatory. We are in a mood problem here.

I think the country is demanding some action. The question is whether we are going to operate through regular channels. You have a public relations problem and I don't know how you get around it without the worst of it, and that is having Federal bureaucrats out there carrying out the orders. That is a popular thing to mention these days, Federal bureaucrats.

Mr. LOBERG. The point I think that should be stressed is there are certain limitations on the ability to fulfill the requirements. For example, Washington Natural Gas has been actively promoting conservation devices and have had to withdraw their various types of campaigns because they are unable to fill the orders that have been accruing in a number of cases.

What we are trying to develop here is an understanding there are facilities, there are means, by which these programs can be implemented without actually mandating the structure and mandating the pattern and so forth and so on, imposing another level of enforcing the financial aspects of it through the existing utility structure is such it is going to be a much more costly approach than using the existing facilities.

Senator JOHNSTON. What existing facilities?

Mr. LOBERG. Such as some of the Federal programs: FHA, HUD.

Senator JOHNSTON. What is the average size of this retrofit in dollars?

Mr. LOBERG. You would have to break it down from the standpoint of ceiling insulation, it would run from $300 to $500 in cost.

Senator JOHNSTON. Is that for an average-sized home?

Mr. LOBERG. This would be something that is nebulous. It is more square feet than cost of the house, something around 15,000, 16,000 or 17,000 square feet.

Senator JOHNSTON. That would be $300 to $500.

Mr. LOBERG. Yes.

Senator JOHNSTON. What else would you do?

Mr. LOBERG. Storm windows, insulation of the floor; these are the problems that exist when you go across country with certain provisions and requirements.

Senator JOHNSTON. We talk in terms of retrofitting 90 percent I think was the figure used yesterday by the HUD man, 90 percent of the homes. Do you have any idea of what kind of figures they are talking about? I should not be asking you; I should be asking them; but what would you do?

Mr. LOBERG. Are you talking about total dollars?

Senator JOHNSTON. Yes.

Mr. LOBERG. The estimate from the University of Texas study, taking the 74 million homes translated into that 90-percent figure someplace, would be up to $143 billion.

Senator JOHNSTON. How much per home. If you are talking about $300, you are talking about one kind of financing. If you are talking about a couple of thousand, you are talking about another.

Mr. LOBERG. These figures are based on a low of $800 to a high of $2,200. These are the figures used in that University of Texas study which came up with those numbers.

Senator JOHNSTON. You are talking about the kind of area where the creditor is going to want some security; isn't he?

Mr. LOBERG. I would assume so, yes.

Senator JOHNSTON. Either he is going to want to hook on to that gas bill with the right to shut you down on your service if you don't pay, or else he is going to want some other kind of security; isn't he?

Mr. LOBERG. Exactly.

Senator JOHNSTON. What do you think of in lieu of a tax credit, having a Government-guaranteed loan of say 90 percent with a right to hook on to your gas bill with a breakdown on your gas bill between that part that is gas, and that part that is nongas—that part which is retrofit?

The idea is if you don't pay your retrofit, they turn that note back over to the creditor. If you don't pay your gas bill you get your service cut off. What do you think of that?

Mr. LOBERG. That is an interesting concept. Where would the initial capital come on the front end for the retrofit?

Senator JOHNSTON. The Government would guarantee it like a small business loan through the bank or whatever.

Mr. LOBERG. That is an interesting idea.

Senator JOHNSTON. You would have like a 90-percent loan, you would still have 10 percent. Would 10 percent be enough to have the creditor police the reliability of the debtor?

Mr. LOBERG. Ten percent simple interest loan for the life of the loan?

Senator JOHNSTON. Yes.

Mr. LOBERG. I don't see how that would be possible. It just depends on how it would be structured. The direct costs and the handling costs.

Senator JOHNSTON. I don't think you understand my question, but that is all right.

Mr. LOBERG. The biggest concern is having, through some formalized structure, to provide the initial capital through the utility structure. This is the thing that concerns me most.

Senator JOHNSTON. I am concerned about some kind of standards for this work. There are so many fly-by-night people. I think of aluminum siding particularly. When I was practicing law I heard about that. Don't we need somebody to certify the kind of work and the kind of contractors here like the FHA?

Mr. LOBERG. Absolutely, somebody has to make the determination that the job is proper and fulfills the requirements. No question about it.

Mr. LOBERG. This is being done now to a certain extent in varying

Senator JOHNSTON. What do you think about having say the FHA certify the contractor? You would have to be certified by FHA before

you can be eligible to do this, work on a 90-percent loan program, but having it done by private contractors.

Mr. LOBERG. This is being done now to a ceratin extent in varying degrees around the country.

Senator JOHNSTON. I have got to tell you my bias would be to exclude the utilities from this, to have the utilities do the certification but not the work.

Mr. LOBERG. I would agree.

Senator JOHNSTON. You want to stay in the retrofit business, don't you?

Mr. LOBERG. This is the difficulty. Those who have gone forward, those who are making a reasonable contribution now and have a structure in place, I would assume would be given some consideration. They are underway and the success of their program speaks for itself.

Senator JOHNSTON. Grandfather them but exclude the other utilities?

Mr. LOBERG. [Nods head affirmatively.]

Senator METZENBAUM. Mr. Loberg, assuming we need some legislation of this kind, and I understand your position on the subject, what kind of consumer provisions, if any, do you believe should be part of the law to protect the consumer in this whole relationship?

Mr. LOBERG. I think there has to be some determination of what is an adequate product. The product itself has to have some certification of some kind. We are speaking now about insulation. The quantity of it has to have some sort of determination.

Senator METZENBAUM. Who should make that determination? Somebody ought to.

Mr. LOBERG. There are facilities, there are testing laboratories, there are ways of developing specifications through the American National Standards Institute, participation in NBS, there are a number of participations that can be made. I believe there are specifications now underway for approval. I am sorry, I am not completely up to speed, maybe someone else on the panel can answer that question.

I believe there are specifications now in terms of insulation.

Senator METZENBAUM. I think Senator Johnston was asking you something about a flat rate provided in the law pertaining to an interest rate if a utility is involved. Was that the thrust of his question?

Mr. LOBERG. Yes; was a certain percentage adequate? I think it would have to be defined a little more clearly as to what is entailed in the process. The responsibility for the loan, the collection procedure, et cetera.

Senator METZENBAUM. I can understand that. Setting a rate today might not be the proper rate 3 years from now. What would you think of tying the rate to the prime rate? My guess is in most utilities they use an add-on rate, not a flat rate. They spread out the figure. What would you think of tying it into an effective rate as related to the prime?

Mr. LOBERG. I would like to beg off that question in this respect. As far as the application of rate and percentages, things of this nature, this is outside the area of my expertise. It is our position the public utility commission that worked closely with each of their respective utilities is in a far better position to ascertain the proper measure better than some sort of general approach.

Senator METZENBAUM. Mr. Loberg, what—one of the things that bothered me in this energy crisis is the failure to take some steps that could be taken now rather than waiting for legislation. If the gas industry were called upon by the administration or the President to see to it that all of those gas burning lights that are burning at this very moment outside of homes, with the gas industry's cooperation, the decorative lights——

Mr. LOBERG. There is no question, they have the decorative aspects, absolutely.

Senator METZENBAUM. What have they done so far?

Mr. LOBERG. I don't know what the actual number of turnoffs are, but the percentage is extremely high. The only contention that has ever been made is where these lights are performing some sort of security function. The majority of them now as far as I am aware of have been cutting out the lights.

Senator METZENBAUM. They can just do that by order of the company. Come with me to Georgetown, there are still some of them burning there.

Mr. LOBERG. The customer still has some options. He purchased the light he is using. As far as compliance with the law, absolutely, if this becomes law. But now we are talking about walking in an area where the man has made an investment, a personal judgment. We have been working in the other direction.

Senator METZENBAUM. We need a mandatory law?

Mr. LOBERG. These may be very visible, these lights you are describing now, but most of them, I believe, have been turned off, other than those that perform a security function.

Senator METZENBAUM. We cannot afford to waste any gas, can we?

Mr. LOBERG. I agree.

[The prepared statement of Mr. Loberg follows:]

STATEMENT OF THOMAS J. LOBERG, DIRECTOR OF MARKETING SERVICES, AMERICAN GAS ASSOCIATION

I am Thomas J. Loberg, Director of Marketing Services for the American Gas Association (A.G.A.),

I am testifying on behalf of A.G.A., which is composed of 300 member companies furnishing natural gas distribution and transmission services to over 160 million consumers in all 50 states. A.G.A. member companies provide approximately 85 percent of the nation's natural gas utility sales. Natural gas alone supplies 43 percent of the primary energy consumed by residential and commercial establishments, and over 40 percent of the energy used by U.S. industry.

Our major concern with the Utility Conservation Program provisions of the National Energy Act (S. 1469) is the federally-mandated program it establishes. This legislation can be improved to more effectively meet the goal of conserving more natural gas supplies. A.G.A. recommends instead of mandating such a Federal program, a voluntary program should be established at the state level by the state public utility commissions who are more familiar with the economic, supply, baseload pattern, and climatological considerations inherent in such a program. State PUC's are also better equipped to review rate-making considerations for utility conservation programs.

We recommend this approach because:

A state program under the auspices of the state PUC is more efficient since it would eliminate the need for a second tier of Federal implementing regulations and would minimize Federal involvement in an area of proper state concern.

Finally, the free enterprise system is already at work providing thermal retrofit services to consumers. In some cases, there already exist plans that are being effectively implemented. Abrogating such plans could be counter-produc-

tive and could impede further development of necessary conservation services to consumers.

Gas utility activities in marketing attic insulation have increased dramatically in the past two years on a voluntary basis along with interest in other conservation devices, such as wall insulation and clock thermostats. This shows the marketplace can work in conjunction with a sense of public utility responsibility and state PUC cooperation to achieve desirable results without the restrictive, unnecessary, federally-mandated framework established in this bill.

DIMENSIONS OF THE UTILITY FINANCING PROBLEM

The National Energy Plan establishes the goal of insulating 90 percent of all residences by 1985. Using the Plan's estimate of 74 million residences, the University of Texas, in a recent study, estimated the gross cost of installation of energy conservation measures in the range of $53.3 to $146.5 billion. This range reflects average costs of installation running from a low of $800 per residence to a high of $2,200. Further, the cost of borrowed capital ranges from $23.9 billion to $67.5 billion.

Mandatory utility financing of energy conservation programs would impose serious investment burdens upon the gas utility industry. Gas supply requirements independent of conservation savings dictates that the industry must engage in a massive capital program during the next ten years. We anticipate capital expenditure requirements of $66 billion (in terms of 1975 constant dollars) by the mid-1980's—which compares to the industry's gross plant of $50 billion at the beginning of 1976. Additional capital requirements to support financing of energy conservation programs could seriously undermine the financial integrity of the industry, force dangerous delays in vital conventional and supplemental supply projects, and obstruct the ability to maintain current utility operations.

Some A.G.A. member companies have estimated that the capital requirements to support financing of energy conservation programs within their service area range from $500 million to $1 billion—a figure that, in many instances, exceeds their total investment in existing plant. Further, there are serious problems in raising these amounts in conventional money markets because of problems in the area of collateral pledged to secure this financing. The utility would not own the materials installed nor the residential structure itself, and therefore could not offer suitable collateral to secure the capital necessary to support the financing. Installations of insulation on the property of utility customers would not meet the definition of "bondable property" because of limitations imposed by the particular state PUC or by particular indenture restrictions, in some instances.

Further, mandatory utility financing would subject the gas utility to the spectre of increased debt collection programs at a time when the industry is coping with 25–35 percent increases in bad debt accounts for traditional utility service, as an outgrowth of this past harsh winter. Most gas utilities are not structured to be in the business of determining who receives loans, handling partial payments on loans, coping with defaults, and handling enforcement actions. The Federal Government should allow the utilities and their state commissions to evaluate and determine the utilities' role in such a program. Gas utilities should not be federally mandated into changing the basic nature of their business.

Finally, the prospect of rising wholesale and retail prices for insulation and retrofit devices raises the spectre of utilities having to cope with possible Federal controls or restraints on the prices of insulation and retrofit devices, or overcharging by contractors for services. This could lead to failure of contracts and increased administrative costs to utilities.

DEFINITIONS

The definition of "residential energy conservation measure" which includes certain furnace efficiency modifications should be modified to reflect safety considerations associated with increasing combustion efficiency and modifying flue openings. A.G.A. recommends the definition include furnace efficiency modifications to combustion efficiency and to flue openings when such modifications or retrofit devices are certified by an accredited testing laboratory, and the installers are properly trained.

ANTITRUST AND PRODUCTS LIABILITY PROBLEMS

Section 103 requires utilities to enter the retrofit installation business. While the gas industry supports the increased use of retrofits for conserving gas, there are serious problems in the proposals as stated:

Under Section 103, utilities must list and sell all available retrofit products, whether tested or untested, safe or unsafe, and whether they save gas or not. To do otherwise would invite antitrust litigation on the part of retrofit manufacturers or even the government. In addition, utilities would become the product liability insurers and guarantors of such devices when they are sold. To prevent this unfair result, the legislation should specifically require the State Regulatory Commissions to compile lists of recommended devices and exempt utilities from the antitrust laws when acting pursuant to a mandated plan. Also, it should exempt utilities from product liability and other liability relating to their installation and use when such devices are not directly supplied by or installed by utilities.

There are also regulatory barriers to conservation programs. Section 107 removes contractual barriers to installing retrofit devices. In reality, the barriers are more regulatory than contactual. Therefore, this section should be broadened to provide an exemption from Federal and state regulation of utility company participation in retrofit and other conservation programs.

INFORMATION REQUIREMENTS OF UTILITY PROGRAMS

The portions of the bill that require suggested conservation measures, energy savings and availability of arrangements should be limited to the specific utility providing heating service to the residential customer. This will maximize conservation efforts toward the major household consumer of fuel or energy—space heating.

Also, the "information on energy savings" provision should be modified to include only an estimated range of energy savings. Energy savings is an imprecise science at best that cannot take into account such subjective considerations as personal lifestyle and use patterns, which cannot be defined in reaching an ultimate conclusion on energy savings to the customer.

SERVICE REQUIREMENTS FOR UTILITY PROGRAMS

A.G.A. wants to make it clear that gas utilities do not want to be in the business of competing with contractors or with financial institutions for thermal retrofit services or conservation loan financing. The financing service provision of the bill should be modified so that the utility would be in a position to offer to refer customers for financing through: Conventional financing sources, or Federal program sources, or State program sources, or the utility's own financing program.

This would offer maximum financing flexibility for the customer and insure that a specific company was not forced into the consumer financing business in which it may lack fundamental expertise and the necessary capital resources.

Also, the financing program amendments to the National Housing Act would classify a public utility as a "financial institution" or "loan institution" if it makes loans for energy-conserving home improvements. This provision establishes a dangerous precedent with the added dimension of introducing a wide, new array of reporting requirements for utilities and potential compliance requirements with a wide variety of banking laws. These increased costs of reporting and compliance would ultimately be borne by all customers. A.G.A. strongly recommends that utilities be exempt from any new regulatory reporting and compliance requirements of Federal, State and local laws, if classified as a "financial" or "loan" institution.

Finally, the service requirements in the bill would allow the borrower to repay the loan for a period of no less than three years. A.G.A. believes this provision is unduly restrictive and recommends that the borrower have the right to voluntarily accelerate payment on the loan without incurring any penalty.

ALTERNATIVE PROGRAMS

A.G.A. commends and supports the provision in the bill permitting alternative installation programs since it provides needed flexibility to utilities already

actively engaged in thermal retrofit programs. However, the requirements for alternative programs need further modification in two respects:

"The savings likely from the measure" should be modified to an estimated range of energy savings, for reasons previously mentioned.

The provision covering "other requirements set by the Administrator" is too open-ended, and could effectively operate to limit development and progress of programs that are already underway, and programs that are more effective and more efficient. Also, Federal regulations too often are ineffective at setting national average requirements. A.G.A. recommends this provision be deleted from the bill or, in the alternative, be modified to include more specific provisions in the bill itself or in its legislative history.

FEDERAL STANDBY AUTHORITY

The bill provides that the Administrator could freeze the rates of a utility if it fails to comply with an order. This provision should be deleted since Federal injunctive authority provides adequate enforcement authority with sufficient procedural safeguards.

CONSERVATION GAS OF FINDERS-KEEPERS RULE

A.G.A. urges the Committee to include a finders-keepers or conservation gas section in the bill to effectively insure that gas conserved within a utility's system will revert to that utility for it to sell or use to minimize the disruptive impact of curtailments on others users. This provision would also provide an added incentive for vigorous conservation programs and more rapid achievement of our national energy conservation goals.

On behalf of the American Gas Association, I want to thank you for this opportunity to testify today. I will be glad to answer any further questions.

Senator JOHNSTON. Gentlemen, the schedule is limited. The plan was to have this first panel completed by 7:45. We have taken 33 minutes, that leaves 12 minutes for three witnesses. We will have to go over a little bit, but gentlemen, please summarize your testimony. We will not permit any more reading of testimony.

Next I want to recognize Mr. Dwight Swanson.

STATEMENT OF DWIGHT H. SWANSON, CHAIRMAN, COMMITTEE ON CONSERVATION AND ENERGY MANAGEMENT, EDISON ELECTRIC INSTITUTE, ACCOMPANIED BY PAUL GREINER, VICE PRESIDENT

Mr. SWANSON. Thank you, Senator. I will do just that, try to summarize. I would like to pass along to the panel here some of the things that are actually going on in the industry, if I may.

My name is Dwight Swanson. I am chairman and president of the Iowa Power & Light Co. and chairman of the Policy Committee on Conservation and Energy Management of the Edison Electric Institute. I have with me Mr. Paul Greiner, vice president of EEI. He is also available to answer questions if needed.

EEI and its member companies have been active in the area of conservation and energy management for a number of years. Last week, the board of directors of EEI officially approved an energy conservation program for new and existing residential units. We intend, with this program, to develop within the electric utility industry, the same capability to market conservation in energy management that we had in the 1950's and 1960's, for the purpose of stimulating public participation.

We will promote our program under the name, the "National Energy Watch." This symbol has been especially developed for this program.

The basic thrust will be a number of energy efficiency guidelines dealing with both the thermal efficiency of a residential structure itself, insulation infiltration, and also with the efficiency of electric systems and appliances within it.

Each individual guideline will be given an assigned point value for full compliance. Homeowners whose homes score at least 80 percent of the total number of points possible will be appropriately recognized by the local utility. Owners of existing homes can also qualify for National Energy Watch membership.

To stimulate homeowner participation in the program, we plan many of the same incentives outlined in S. 1469, including the following: Financial assistance, remodeling assistance, tax credit as approved by Congress.

We intend to make the National Energy Watch a major activity for EEI and its member companies, not only for the balance of the year, but predictably for several years to come as long as the need exists.

I would like to move quickly over to some of the activities we have been doing in our company. These are basically voluntary insulation programs throughout the 5,600 square miles of our service area in central and southwestern Iowa. This program has been carried on through mass media advertising, energy conservation seminars for customers, school information seminars, and work with builders and developers. We have a registered insulation dealer program which contains reasonably stiff accreditation and performance requirements monitored by the dealers who participate.

Each participating dealer is required to have a performance bond to assure satisfactory performance. Dealers who do not live up to the requirements, are dropped from the program and are not recommended to companies. In the Des Moines area alone 24 qualified insulation contractors are now participating with us. We think the program has been successful and we plan to continue.

We expect insulation activity to increase even more as insulation contractors and suppliers are able to handle the business, because of increased home-heating costs. On the other hand, it is obvious only a limited number of customers who have actually added insulation are taking advantage of our company financing plan.

Dealers tell us financing has been very important as a sales-closing tool. It removes an excuse for not acting. After that roadblock is removed, most prospects decide to pay the relatively low cost themselves rather than go through the financing mechanism.

We made a recent telephone survey of the Des Moines area. Insulation contractors which came up with the interesting results of: (1) Their business has nearly doubled in the past year; (2) they have added significant numbers of new employees; (3) they cannot obtain enough insulating material at the present time to keep up with demand; (4) they expect the business of reinsulating existing homes to peak in the next 2 to 3 years; and (5) 90 percent of the homes in the Des Moines area will be insulated by 1985 through voluntary actions of the current rate.

Putting utilities into the insulation business will not create more insulating material which is a presently limiting factor in the Iowa power service area. We conclude the current voluntary program is on

target and is best left in the hands of the small businessman insulation contractors who we think are doing an outstanding job.

We are not alone in this activity. A few months ago, with the encouragement of the Iowa State Commerce Commission, the seven utilities in Iowa jointly announced a conservation program. This includes insulation and energy-efficient standards for new and existing structures. A statewide energy audit program for all structures, industrial, commercial seminars and education programs and insulation planning.

Senator JOHNSTON. Mr. Swanson, let me summarize. We just do not have the time for you to read your statement.

Mr. SWANSON. The point I was trying to make here is a recent survey in Iowa has shown 30 percent of the customers in Iowa have added some form of insulation in the last 2 years, and about 77 percent of the customers are doing something relative to the other areas, turning down thermostats and the conservation methods that have been advertised.

In summary, I would basically urge this committee to take action on the legislation you are considering soon. People in Iowa want to conserve and they have done a good job. This can be documented by the gas results and electric sales results for the last 2 years.

Nevertheless, there are delays and I think indecision at the present time. Many of the customers are waiting to see what happens in Washington before proceeding to insulate and add other energy conserving materials.

I have a letter sent to our commission relative to their concerns, having done a job of insulation, they would be paying the cost for others who have not done it. I believe that is typical of many of the customers, the 30,000 or so in our area who have insulated. A voluntary program, in my opinion, does work. It has worked in Iowa given the number of competent installers available and the ability of insulation manufacturers to produce the product.

I don't believe a mandatory insulation program for all structures will result in more insulation being installed in our area, in the last couple of years. I think that summarizes it quite well. I could go into some detail that we think perhaps could be changed. We would be glad to submit any recommendations.

Senator JOHNSTON. Thank you very much indeed, Mr. Swanson. We will come back for questions if we have time.

[The prepared statement of Mr. Swanson follows:]

STATEMENT OF DWIGHT H. SWANSON, CHAIRMAN, COMMITTEE ON CONSERVATION AND ENERGY MANAGEMENT, EDISON ELECTRIC INSTITUTE

My name is Dwight H. Swanson. I am Chairman of the Board and President of Iowa Power & Light Company and Chairman of the Policy Committee on Conservation and Energy Management of the Edison Electric Institute, the principal national association of investor-owned electric utility companies. I have with me Mr. Paul C. Greiner who is Vice President of the Edison Electric Institute. The member companies of EEI serve some 99% of all customers of the investor-owned segment of the electric utility industry, and 77% of the nation's electricity users. We appreciate this opportunity to present our views on S. 1469.

EEI and most of its member companies have been active in the area of conservation and energy management for a number of years. The Institute's offi-

cially stated view is that conservation and the elimination of waste must be at the base of all energy policy.

Earlier this year, EEI's Board of Directors adopted a resolution which states that, "EEI and its member companies should further develop action programs to support a full commitment to conservation. EEI supports the concept of the proposed Energy Department and the objectives of eliminating waste and providing an adequate energy supply for America's needs—utilizing to the fullest extent our coal and uranium resources." Recently, EEI's President, W. Donham Crawford, pledged publicly that the investor-owned electric utility industry would take a leadership role in helping the nation conserve its dwindling supplies of fossil fuels.

Thus, as we have testified before, it is not difficult for EEI to give its full support to the concept and intent of S. 1469 as it relates to energy conservation in the home.

Last week in Philadelphia, the EEI Board of Directors officially approved a national energy conservation program for both new and existing residential units. In its conception; the program takes into account the considerable experience individual companies have already gathered in the development and administration of local programs. We intend with this program to develop within the electric utility industry the same capability to market conservation and energy management that we had in the Fifties and Sixties to market kilowatt hours. I think you might be interested in a brief review of its major features.

For purposes of stimulating public participation, we will promote our program under the name of the "National Energy Watch."

N.E.W. will have three basic objectives. At the national level, the objective will be to help minimize the drain on dwindling fossil fuels. At the industry level, it will be to help reduce the need for costly new generating facilities, and at the homeowner level the primary objective will be to help restrain rising energy bills.

The baseplate of N.E.W. will be a number of energy efficiency guidelines dealing with both the thermal efficiency of the residential structure itself—insulation, infiltration, etc.—and also with the efficiency of electric systems and appliances within it. These thermal insulation guidelines are based on All-Weather Comfort Guidelines that were developed initially by the electric utility industry twenty years ago, and upgraded periodically since then—most recently in February of this year. Each individual guideline will be given an assigned point value for full compliance. Fractional compliance will earn lesser numbers of points. The objective for the homeowner, of course, will be to score as many points as possible. Homeowners whose homes score at least 80% of the total number of possible points will become members of the "National Energy Watch," and will be appropriately recognized as such by the local utility company. Owners of existing homes will qualify for S.E.W. membership if their homes score at least 80% of the total number of possible points, or if they improve their existing score by at least 20%.

To stimulate homeowner participation in the N.E.W. program, we propose many of the same incentives that are outlined in S. 1469, including the following:

1. FINANCIAL ASSISTANCE

A number of financing plans of different types have already been established by many utility companies across the country. Among them:

Programs in which the utility works with the banks and/or other financial institutions in the development of plans which the latter can offer independently to the homeowner.

Programs in which the utility simply serves as a catalyst to bring the banks and the homeowner together.

Programs in which the utility company negotiates the note with the homeowner and then sells it to the bank.

Programs in which the utility does the financing itself at a reasonable rate of interest with the charge to the homeowner either on or off the monthly utility bill.

Programs utilizing Federal funds as they become available.

Many variations of the foregoing plans are possible. N.E.W. will not prescribe any single plan, but will require that participating companies have a plan of their own that is suited to their individual needs.

2. REMODELING ASSISTANCE

As in the case of financing, there are numerous ways a local utility company can help the owner of an existing home handle his contracting and construction problems. Among some that have already been put into effect by one or more companies are the following:

Plans in which the utility handles the necessary paperwork but subcontracts the actual construction to an independent contractor.

Plans in which the utility works in "partnership" with a reputable franchised or licensed contractor who assumes responsibility for actual construction, carries the paper and assumes all liability.

Plans in which the utility gives instruction and other practical assistance to the "do-it-yourself" homeowner.

Plans in which the utility company establishes its own working capacity to do the remodeling work.

Again, there are many variations of plans such as these.

And again, NEW will not prescribe any one plan as long as participating companies develop some plan of assistance that is suited to their individual operating circumstances.

3. MATERIAL AND LABOR ASSISTANCE

Predictably, the availability of materials and qualified labor will be a growing problem at the local level. Participating utilities will endeavor to maintain a current review of both material and labor sources in order to assist the homeowner in the expeditious handling of his needs in these areas.

4. TAX CREDIT

President Carter has proposed that homeowners who "weatherize their homes be given a tax credit of 25% for the next $800 invested in remodeling, and 15% for the next $1,400. If this plan, or one similar, is enacted into law, it will be incorporated as part of the N.E.W. package.

Thus, in brief summary:

I. The objectives of the N.E.W. program are these:

For the Nation.—To help minimize the drain on fossil fuels.

For the Utilities.—To help reduce the need for increased generating capacity.

For Homeowners.—To restrain rising energy costs. To provide additional home comfort levels. To increase property values.

II. The way N.E.W. proposes to achieve these objectives is by offering the homeowner the following package: Assistance in financing; assistance in construction; and materials and labor assistance; and tax credits.

We intend to make the "National Energy Watch" a major activity for EEI and its member companies, not only for the balance of this year, but predictably, for several years to come—as long as the need exists. We began immediately after Board approval to develop procedures for its implementation and administration and for its public promotion, both nationally and locally. We expect most of our member companies to become participants in the effort. We are proud that this is the first nationally organized residential conservation program. And we are proud that it is a voluntary program. I should note, finally, that we have already reviewed N.E.W. in concept with a number of utility industries trade allies and other fuel suppliers with a view to obtaining their active participation in both national and local implementation of it. The response from them so far has been very encouraging. Among the organizations we are working with are the following: American Public Power Association, National Rural Electric Cooperative Association, National Mineral Wool Insulation Association, National Home Improvement Council, and National Cellulose Insulation Manufacturers Association.

Now I would like to discuss briefly the success of Iowa Power's own voluntary insulation program throughout our 5,600 square mile service area in central and southwestern Iowa.

We strongly believe in energy conservation and were one of the first utilities in the nation to begin active educational and informational programs for customers. We've been working at it for the past four years. When we began, we had approximately 175,000 residential electric customers. Through our efforts and through excellent cooperation on the part of insulation manufacturers and local dealers, we estimate that over 30,000, or better than one out of six of those customers have added insulation to their homes. Since that beginning, we have

added another 12,000 residential customers and all of those structures are well insulated and energy efficient.

This program has been carried on through mass media advertising, energy conservation seminars for customers, school information programs, mailings to customers, meetings with insulation dealers and manufacturers, and work with builders and developers. We have a registered insulation dealer program which contains reasonably stiff accreditation and performance requirements monitored with us by the dealers who wish to participate. Each participating dealer is required to have a performance bond to insure satisfactory performance. Dealers who do not live up to the requirements are dropped from the program and are not recommended to customers. In the Des Moines area alone, 24 quality insulation contractors are now participating with us.

In 1974 we recognized the need for a limited financing program. Home improvement loans, which might include insulation and weatherstripping, were of course available at reasonable rates from financial institutions. It seemed to us, however, that financing in smaller amounts might be beneficial, particularly for the lower income homeowner who was beginning to feel the brunt of increasing energy prices. Thus, we instituted a financing program, charging 9% simple interest, which could be paid for over 36 months on the utility bill. Meetings were held with contractors and forms provided for their use. Since that time we have financed 1,250 jobs at a total cost of approximately $365,000. This works out to an average of $300 per job. You can see that the cost is relatively low. Generally, this reflects the amount of money needed to increase attic insulation to approximately an R–30 value, which is our recommended rating.

We think the program has been successful and we plan to continue. We expect insulation activity to increase even more as insulation contractors and suppliers are able to handle the business because of increased home heating costs. On the other hand, it is obvious that only a limited number of customers who have actually added insulation have taken advantage of our financing. Dealers tell us the financing has been very important as a sales closing tool. It removes an excuse for not acting. After that roadblock is removed, most prospects simply decide to pay the relatively low cost themselves, rather than go through the financing mechanism.

Iowa Power and other public utilities are well equipped to assess thermal efficiency of homes, make recommendations on efficiency standards and cooperate with contractors who install energy saving materials. We do not believe we are as well equipped to modernize and insulate individual homes and suggest this is most efficiently done by private contractors.

We made a recent telephone survey of Des Moines area insulation contractors which came up with some interesting results:

(1) Their business has nearly doubled in the past year.

(2) They have added significant numbers of new employees.

(3) They cannot obtain enough insulating material at the present time to keep up with demand.

(4) They expect the business of re-insulating existing homes to peak in the next 2–3 years.

(5) Ninety percent of the homes in the Des Moines area will be insulated by 1985 through voluntary actions at the current rate.

Putting utilities into the insulating business will not create more insulating material which is the present limiting factor in Iowa Power's service area. We conclude that the current voluntary program is on target and is best left in the hands of the small businessman—insulation contractors who are doing an outstanding job at the present time.

In spite of Iowa Power's successful financing program, utilities are not generally accustomed to that function. That is not our business, and we believe it is in the public interest for traditional financial institutions to perform the credit granting function so that families that borrow for energy improvement do not undertake obligations beyond the ability to pay. This is why we are enthused about the fact that a number of recognized financial institutions in our service area have begun to grant special low cost energy conservation loans and to undertake public education programs for customers. Des Moines Savings & Loan Association is a good example. Their Chief Executive Officer, Richard L. Bryan, testified on May 23 before the House Banking Committee's Subcommittee on Housing and Community Development. His institution has started an aggressive program of energy saving loans and will finance residential conservation projects on existing mortgage loans at the same interest rate as the original mortgage. We are

cooperating in every way possible with Des Moines Savings and with other financial institutions and strongly feel that such three-pronged cooperation between the utility, financial institutions, and insulation dealers and manufacturers guarantees that a voluntary program of insulation upgrading is the best way to meet the President's energy saving goals.

We at Iowa Power are also well aware that an adequately funded weatherization program to help low income people saving energy and costs is essential. We have worked in close concert with the Iowa Office of Planning and Programming and other public bodies on such plans. We therefore support the increased funding for the weatherization program as a necessary part of the nation's total residential conservation effort.

Our insulation activity at Iowa Power is simply one facet of a broadbased corporate conservation and energy management plan. This includes consumer publications on wise use of energy efficient appliances, specific energy efficient certification programs for both new homes and existing homes, work with heating dealers on furnace check-ups to insure efficiency, promotion of the energy saving heat pumps, energy audits for residential, commercial and industrial customers, school programs and an active speakers bureau for adult groups.

We are not alone in this activity. Just a few months ago, with the encouragement of the Iowa State Commerce Commission, the seven major investor-owned utilities in Iowa jointly announced a major energy conservation program. This includes insulation and energy efficient standards for both existing and new structures, plans for aerial thermogram photography of all major Iowa communities, a statewide energy audit program for all structures, industrial/commercial customer seminars and education programs, and insulation financing.[1]

As utilities across the country become involved to a greater degree in the kinds of activities I've been describing, the process of inspecting structures to ascertain energy efficiency will become a gigantic task. We are concerned that this be done most efficiently and at lowest cost—while still being accomplished in a manner that will guarantee protection for the homeowner. To this end, we are carrying on discussions with major financial institutions, the U.S. League of Savings & Loan Associations, and major insulation manufacturers to ascertain the possibility of establishing a separate, independent inspection service.

Obviously, there are costs involved in all of the above activities. Such costs must be includable in our rate base. Since the cost-benefit ratio is extremely positive from the consumer point of view, this should be no problem. At Iowa Power, while we have spent a major portion of our advertising budget on energy conservation information, additional costs for the program are minimal, with administrative costs approximating no more than $15,000 annually.

We also admit some difficulty in reaching owners of rental properties, whose occupants are often low income families where improved insulation is most needed. However, we believe these situations are best solved locally, after regional goals have been established. It is, of course, totally unfair to improve an absentee landlord's property at the expense of all ratepayers or taxpayers. Again, a jointly maintained inspection bureau, as mentioned earlier, might be authorized to assess adequacy of existing structures, with reports to local governmental units, so those rental properties which are truly deficient in insulation can be identified and improved.

I urge this committee to take action on the legislation you are considering. People in Iowa want to conserve and have done a good job. This can be documented by gas and electric sales over the last two years. Nevertheless, there are now delays and indecision, and many of our customers are awaiting to see what happens in Washington before proceeding with plans to insulate and add other energy conserving materials.

They also are vitally concerned that fair treatment be provided for those who have taken the initiative in conserving. I have attached a copy of a letter written last February to the Iowa State Commerce Commission by a Des Moines man. He was writing to express his strong opposition to a proposal for mandatory insulation requirements. I'll quote just a sentence or two here—"Thirty years ago I purchased a home. As soon as I could afford it, I had it completely insulated . . . later I had storm windows and weatherstripping installed . . . now this monstrosity would have me pay to do these things for those who have been too lazy, too improvident or too dumb to do them themselves. I say No! No! No! I am sick to the point of death of doing for others the things they will not do for themselves."

[1] See attached supplement for recent opinion survey.

I believe this view is typical of the 30,000 customers I mentioned earlier.

A voluntary program does work. It has worked and is working in Iowa. Given the number of competent installers available and the ability of insulation manufacturers to produce the product, I don't believe a mandatory insulation program for all structures would have resulted in the installation of appreciably more insulation in our area during the last four years.

With regard to specific details of S. 1469, I believe we have these concerns.

Section 102 proposes to give the Federal Energy Administration broad authority to establish rules, guidelines and standards for the overall program. We would hope that this authority would be exercised in such a way as to give the utility industry and its individual member companies maximum flexibility to develop voluntary programs of their own such as the National Energy Watch program I outlined a moment ago. We are convinced that such voluntary programs can be initiated much sooner and administered much more efficiently than imposed Federal programs that may lack appreciation of local operating circumstances and that may become weighted down with administrative detail.

Further, we would call the committee's attention to the fact that in the past, individual companies have been confronted with anti-trust allegations involving the insulation of homes where the utility listed or selected the contractor. Consequently, with any legislation of the type now before the committee, immunity from such anti-trust liability should be provided. In addition, the utility should not be liable to the homeowner in the event of a poor insulation job installed by a contractor.

Additionally, since homeowner participation in any energy conservation program depends substantially on the promotion and advertising of that program, we believe that all such programs should be exempted from any and all state restrictions that exclude advertising and promotion from rate computation.

We believe also that the cost of program administration and the additional personnel required directly and exclusively to implement energy conservation programs of the type contemplated here should be a recoverable cost.

Paragraph (2) (A), Section 103 requires that utility companies, directly or through one or more contractors will inspect the residential building to determine and apprise the residential customer of the estimated cost of purchasing and installing each suggested (conservation) measure no later than January 1, 1980.

Let me give you some indication of what this means in terms of manpower. There are approximately 57 million low-rise family homes in the United States. Omitting the time required to train a competent work force to inspect that many units, and figuring that one man can inspect four houses per day at two hours per house, it follows that it would take 114,000,000 man hours just to get the inspection done by January 1, 1980. Figuring a 40 hour week, that translates into an inspection work force of 28,500 men to do the job in the proposed time.

That's the estimated manpower requirements just for *inspection.* When it comes to actually doing the work, it becomes even more difficult. Paragraph four, Section three, "National Energy Goals," establishes it as one of the goals to insulate 90% of all American homes by 1985.

Based on the experience of some of EEI's member companies, we estimate that it takes four man-days to insulate one residential unit. If you take the estimate that there are approximately 57 million low-rise homes in the U.S., it figures out that we would need a work force of 102,600 men working forty hours a week to insulate 90% of the 57 million homes in the years 1978 to 1985 inclusive.

Clearly, the manpower requirements we are setting up for ourselves are substantial.

We are also concerned that any mandatory inspection program imposed on utilities will be an invasion of privacy that many residential customers will resist. Utilities are unpopular enough without having to be the Government's insulation policeman without any choice in the matter.

Finally, we are concerned by the provision in the proposed legislation that stipulates that remodeling loans arranged for residential customers by utility companies shall be repaid over a period of not less than three years as part of the customer's periodic bill. To date, our experience has been that including these charges on monthly bills greatly aggrevates high bill complaints and thus adds to our administrative workload. We would much prefer language in the bill to permit separate billing or other payment arrangement by the lending agency.

I have brought with me suggested modifications in the bill covering the foregoing specific points. I would be happy to submit copies of these suggestions to the committee if it is interested.

I would like to conclude by praising President Carter's bold program to alert the nation to the consequences of energy waste. I am pleased to offer our suggestions to your committee, knowing that your group and the Congress will improve on the President's beginning and initiate action that will be effective and equitable to all Americans.

In summary, allow me to say again that the investor-owned electric utility industry gives its full support to the concept and intent of the National Energy Act as it relates to energy conservation in the home. We believe our National Energy Watch program will help materially in the attainment of those objectives, and we stand ready to offer additional assistance in any practical way to further this critically important effort.

Thank you.

TESTIMONY OF DWIGHT H. SWANSON

SUPPLEMENT

A recent opinion survey conducted by the Iowa Market/Opinion Survey organization for the Iowa Utility Association indicated that 30% of those questioned have added insulation in the past two years and that 55% of those having added insulation did it themselves. In addition, 90% of Iowans say that they have taken some action to conserve energy at home. For example: 77% have turned their thermostats down in the winter and up in the summer; 72% have lowered their thermostats at night; and 56% have added weatherstripping and caulking around doors, windows or other areas of the home. We think that kind of response is significant and encouraging.

SUMMARY

Edison Electric Institute, and most of its member companies, have been active in the area of conservation and energy management for a number of years. The Institute's officially stated view is that conservation and the elimination of waste must be at the base of all energy policy. It is not difficult, therefore, for EEI to give its full support to the concept and intent of S. 1469 as it relates to energy conservation in the home.

Last week, the Board of Directors of EEI approved a national energy conservation program for both new and existing residential buildings. With this program, we intend to develop within the industry the same capability to market conservation that we had in the Fifties and Sixties to market kilowatt hours. For purposes of stimulating public participation, we will promote the program under the name, the "National Energy Watch." The baseplate of N.E.W. will be a number of energy efficiency guidelines dealing with both the thermal efficiency of the structure itself, and also with the efficiency of electric systems and appliances within it. We have developed a system of "scoring" full and partial compliance with these guidelines. If the owner of a new home scores 80% of the total number of points possible, he will qualify for membership in an organization to be known as the "National Energy Watch." Owners of existing homes will qualify for N.E.W. membership if they score 80% of the total possible or if they improve the premodification scores of their homes by at least 20%.

To stimulate homeowner participation in the N.E.W. program, we plan to arrange, in a variety of ways suitable to the operating circumstances of local utility companies, many of the same incentives that are proposed in S. 1469 including arranging for financial and remodeling assistance.

With regard to specific details of S. 1469, we have these concerns:

The bill proposes to give the FEA broad authority to establish rules, guidelines and standards for the overall program. We would hope that this authority would be exercised in such a way as to give maximum flexibility to the utility industry to develop voluntary programs of its own.

Further we would call the committee's attention to the fact that in the past, individual companies have been confronted with anti-trust allegations involving the insulation of homes where the utility listed or selected the contractor. We believe that immunity from such anti-trust liability should be provided. Also, we believe the utility should not be liable to the homeowner in the event of a poor insulation job installed by the contractor.

Additionally, since homeowner participation in any energy conservation program depends substantially on the promotion and advertising of that program, we believe that all such programs should be exempt from state restrictions that exclude advertising and promotion from rate computation.

We believe also that the cost of program administration and additional personnel required directly and exclusively to implement energy conservation programs of the type contemplated here should be a recoverable cost.

We are also concerned that any mandatory inspection program imposed on utilities will be an invasion of privacy that many residential customers will resist.

Finally, we are concerned by the provision that stipulates that remodeling loans arranged for residential customers by utility companies shall be repaid as part of the customer's periodic bill. Our experience has been that this practice often aggrevates high bill complaints and thus adds to our administrative workload. We would much prefer language in the bill to permit separate billing or other payment arranged by the lending agency.

Senator JOHNSTON. Mr. Fawcett is next.

STATEMENT OF ROBERT W. FAWCETT, CHAIRMAN, FUEL OIL SUPPLY COMMITTEE, NEW ENGLAND FUEL INSTITUTE

Mr. FAWCETT. My name is Robert W. Fawcett. I am a small independent home heating oil dealer in Cambridge, Mass. I represent today the New England Fuel Institute which has 1,300 members in New England supplying about 75 percent of the oil and heating needs of New England.

I represent the Oil Heat Institute of Long Island which supplies about 600,000 homes in Nassau and Suffolk Counties, and the Oil Heating Institute of Westchester which represents about 45 fuel oil dealers who market primarily to retail customers in Westchester and Putnam Counties, N.Y.

I have entered a written statement. I am going to speak on three points briefly, as I know them in New England; and the facts I give you for New England would apply for Long Island and Westchester.

The first item I would mention is in the Government grant subsidy for new equipment. There is mention of the oil burner that could be replaced with a more modern one. There is no mention of the integral part of the heating system: The furnace or the boiler.

In New England, and along the eastern seaboard, where you have many older communities, the boilers and furnaces are, in some cases, 20 to 30 years old. Many were designed for the use of coal and were converted to oil and are very inefficient. There are some gravity warm air furnaces in installations that are 40 percent effective. No matter what you do to them, you cannot improve the efficiency very much by installing a new oil burner.

I wish you would consider including in the program furnaces and boilers and certainly include them in the financing part of it.

The second point, as the program is put forth, the utility in the area is the one to recommend, install, or have installed, through a bid list of customers, the retrofit equipment. In New England where 75 percent of fuel is supplied by oil heating dealers, the dealers are not in the program. They are relegated to a contractor's status.

If I were a gas utility or an electric utility and put out a list of contractors, there would be very few of the oil dealers on that list. I don't say this as any criticism of the utility. If I were a utility, I would do it the same way.

We have in New England about 8,000 to 10,000 installation and service people who are fully qualified today to go into a home to replace a boiler, to replace a furnace, to replace an oil burner. Our company, over the last 3 years since the embargo, has replaced an oil burner every day of the year.

We would no longer be able to do this with the Government's program. We would have to go through the utility. Our customers would be penalized. If the utility selected a contractor to put in the burner, it would immediately have a conflict of interest. The oil dealer would be the one who serviced, someone else would be the one who installed. If anything went wrong, it is human nature for one to blame the other.

Senator JOHNSTON. Suppose you had the FHA running the program certifying all contractors? In order to be able to get a Government-guaranteed loan, you would have to be on the list of certified Government contractors. Loans would be guaranteed up to 90 percent of the principal. In order to be an FHA-certified contractor, you would have to adhere to some certain minimum standards, you would have to give them a warranty, be relatively complaint free, at least not have complaints that turned out to be your fault.

But if you are a certified contractor, you got on a list the utility would furnish, all they would do is furnish to the customer a list of certified contractors. What is wrong with that?

Mr. FAWCETT. I guess part of what is wrong with it is that I have been in business competing with the utilities for many years. I would rather have it published through FEA or the State energy agency.

Senator JOHNSTON. I would not let the utility be in the business unless they had already been in it.

Mr. FAWCETT. I like the idea of having FEA work through the State energy agencies, and I know the New England Fuel Institute would work with them to set up a qualified list, I think that is a great idea.

I don't think the utilities are too much in favor of taking the burden of this supervision, installation, and the whole ball of wax. I think they are probably qualified and interested in the gas utility certified gas installations and the electric utilities certifying electric installations.

You must have a program and a strict program to qualify those dealers as adequate to perform up to the standards. FEA or the State energy agencies should qualify, but I do not like the idea of it going through the utility.

On the financing, I was involved in converting literally thousands of coal-burning equipment to oil. We had FHA loans at that time that were handled through the banks. The oil dealer signed a note on the bank's letterheads, so to speak. It was taken to the bank, it was discounted at the bank.

The bank is qualified and set up to handle the financial side of it. I see no need for making the utility a financial institution. I think it has been done through the banks and could be done through the banks in the future.

I hate to see a setup of 8,000 to 10,000 qualified, certified oil dealer mechanics and technicians left by the wayside in this program. I gave to you gentlemen a program our company has in effect now which is probably more strict than the qualifications which would be set up. It

does not have to be mandatory. We are doing it and we are doing it in a free enterprise system.

We are selling products to our customers that they need and that will conserve energy. If it is mandatory, it doesn't make any difference; we are doing it anyway. I think the oil dealers should be brought into this program on an equal footing with the utilities, not as a contractor of the utilities. Have the program set up through the State energy agency with the help of FEA and the local trade associations and have strict qualifications. Do not have a division of responsibility. Have the people who do the work continue doing it and continue the operation we have been doing for the last 30 years.

[The prepared statement of Mr. Fawcett follows:]

STATEMENT OF ROBERT FAWCETT, CHAIRMAN, FUEL OIL SUPPLY COMMITTEE, NEW ENGLAND FUEL INSTITUTE

Mr. Chairman, my name is Robert Fawcett. I am President of Fawcett Services, an independent retail home heating oil company located in Cambridge, Massachusetts, and serving fuel oil consumers in the Metropolitan Boston area. I am a past president of New England Fuel Institute and am a member of its Executive Committee, Board of Directors and Chairman of its Fuel Oil Supply Study Committee. I am appearing today on behalf of the New England Fuel Institute ("NEFI"), the Oil Heat Institute of Long Island ("OHILI") and the Oil Heat Institute of Westchester ("OHIW") to address certain aspects of President Carter's energy program.

NEFI is an association of 1,300 independent retail and wholesale home heating oil distributors throughout the six-state region. The independent marketers serve over 2.4 million retail home heating oil consumers and market 85% of the 4 billion gallons of No. 2 home heating oil sold in our area at the retail level and 40% of the gallonage at wholesale. Seventy-one percent of all of New England's buildings and 74% of its population are heated by oil. Members of our association also market residual fuel oil at the wholesale and retail levels.

OHILI is composed of about 300 independents who serve more than 600,000 oil-heated homes in Nassau and Suffolk Counties. It should be noted that the area has the highest concentration of oil-heat consumption with more than 85% of all homes heated by this fuel.

OHIW is composed of approximately 45 fuel oil dealers who market No. 2, No. 4 and No. 6 fuel oil, primarily to retail customers in Westchester and Putnam Counties in New York.

The independent home heating oil dealers and distributors strongly support the general objectives of the President's National Energy Plan. We are pleased at the recognition given to the home heating oil consumers and the independent retail dealers who serve them. We are also pleased that among the major goals established by the President are: strengthening of the conservation effort by the Federal Government, keeping the cost burden on homeowners at a minimum, establishing equal pricing for all fuels, and reducing the complexity and magnitude of Federal controls and regulations.

We urgently request that this Committee consider and adopt several specific amendments to Part A of The National Energy Conservation Policy Act, as set forth in Committee Print No. 1. These amendments are designed to insure that the major goals of the President's Plan are more effectively implemented.

1. Section 101.—Definition of Residential Energy Conservation Measure.

We are pleased that the President is proposing to provide significant financial support and encouragement for investment in residential energy conservation plans and measures. However, as submitted to the Congress, the draft legislation is too narrowly drawn. As the Committee will note, Subsection 101(11)(B) on page 5 of the Committee Print—defines "residential energy conservation measures" to include certain "furnace efficiency modifications," but limits these to "replacement burners." This is one, but not the major, heat transfer component of the residential heating system. Additional components are, of course, the furnace (for warm air heating) or boiler (for hot water heating). The experience of our members in the field has shown that the installation of a new oil burner and furnace or boiler can result in fuel savings of 20–40%. When

one recognizes that the average heating plant in the Northeast is 13 years old and that about 30% of the furnaces and/or boilers are from 18–20 years old, the potential for conservation is immense. The members of our associations have found that the replacement of simply a burner in older oil heating equipment may not be enough to optimize energy conservation. In those cases the complete replacement of a furnace or a burner may be necessary to achieve the energy savings anticipated.

For this reason, the definition of Subsection 101(11)(B) is extremely important. However, as indicated, the specific language does not permit consumers to employ the most effective conservation measures and to achieve the greatest saving in home energy consumption particularly during Winter.

If this Committee and the Congress have as their objective the insuring of maximum conservation of fuel oil and other heating fuels, the language needs to be broadened. Therefore, NEFI strongly recommends that Subsection 101(11)(B)(i) be amended to read:

". . . replacement burners, *boilers, or furnaces which devices* are designed to reduce the firing rate or to achieve a reduction in the amount of fuel consumed as a result of increased combustion *or absorption* efficiency." (emphasis added)

Such a practical amendment will insure that homeowners are encouraged to install the basic components of a more efficient oil heating system and will insure that the most effective quantitative energy conservation will be achieved.

2. Sections 102–105.—Residential Energy Plans and Utility Programs.

Our associations are deeply disturbed by the provisions on pages 7–15 of the Committee Print. Under these provisions exclusive responsibility and emphasis is placed on the electric and gas utilities to implement the residential energy conservation plans and programs. Utilities are not only required to inspect and audit buildings but also to recommend and install specific energy conservation measures and provide financial support and loans to customers for such measures.

The Fact Sheet and other background material released by the White House clearly stated that the fuel oil dealers and other fuel marketers would also be encouraged to provide these services. Unfortunately, the legislation is silent on this issue.

In view of the serious anti-competitive impact of granting exclusive control of the home insulation and equipment installation business to a monopoly—the utilities—and in view of the serious cost impact on consumers who would be deprived of the benefits of competitive service, our associations urge that this Committee amend Sections 102–105 as outlined below. It would be ironic indeed if the independent companies who have been deeply involved for many years, in the installation of heating equipment and insulation, were suddenly shut off from this business, and the utilities—who have little or no experience—were given exclusive responsibility.

Our associations strongly recommend that the Committee redraft these provisions to embody the following basic principles relating to the role of independent fuel oil marketers:

First, the energy offices of the individual states would be directed to establish residential energy conservation programs in which independent heating oil marketers and other fuel marketers and contractors could participate. Associations such as NEFI, OHILI and OHIW would be encouraged to work with the state offices and the Federal Energy Administration in development and implementation of these programs.

Second, under the state programs independent marketers would be encouraged to participate in the initial inspection and audit of residential buildings. They would have first responsibility for conducting such inspection of the residences for which they provide heating fuels. The state energy offices would be required to provide such technical assistance and direction as is needed by the individual marketers.

Third, under the state energy office programs, independent fuel oil dealers would be encouraged to provide the actual installation services. Again, the state energy offices would be required to provide such technical and financial assistance as is needed by the individual marketers. As indicated, many dealers have been deeply involved in the insulation and equipment business for many years and we are in the best position to provide consumers with efficient competitive service. We wish to continue to provide these services to residential consumers; not be in effect frozen out. We might note that the House Subcommittee on Energy and Power recently made welcome and significant changes in the President's plan

designed to encourage participation by fuel oil dealers in the installation program.

3. Section 110–114.—Financing Program.

The objective of these five sections is, of course, to insure that sufficient financial support is provided under the National Housing Act, the Federal Home Loan Mortgage Corporation Act and the Federal National Mortgage Association Act. In order to insure maximum achievement of these objectives we urge the Committee to consider several amendments.

First, Section 110 must be amended to insure full participation by and support for retail fuel oil dealers in the conservation programs, for the reasons outlined above.

Second, the remaining three sections should be amended slightly to conform to the definition in Section 101. On page 18 (line 18), page 19 (line 7), page 19 (line 20), and page 20 (line 11) of the Committee Print the word "residential" should be inserted before the word "energy."

In addition, in order to insure equal access to these sources of financial support and full participation by independent fuel oil dealers in these financial programs, we urge that appropriate direction be included in the Committee Report and related legislative history on subpart 2 of Part A of the National Energy Conservation Policy Act.

* * * * * * *

In conclusion, New England Fuel Institute, Oil Heat Institute of Long Island and Oil Heat Institute of Westchester appreciate the opportunity to appear before this Committee. We strongly recommend the several amendments outlined above, which are designed to broaden the energy conservation program to insure that consumers have access to a range of competitive services, be adopted and that the Committee act favorably on Part A of the Act in the near future.

Thank you very much.

Senator JOHNSTON. Mr. Glass.

STATEMENT OF CHARLES D. GLASS, VICE PRESIDENT, CUSTOMER RELATIONS, GULF STATE UTILITIES

Mr. GLASS. I would like to discuss some of the conservation practices we have undertaken voluntarily over the past few years and then comment on some aspects of the bill as we understand its intent.

One: Our company has been involved in the financing of insulation, high-efficiency air-conditioning which is very important in our part of the country because this is the thing that creates——

Senator JOHNSTON. You mean essential.

Mr. GLASS. Yes, essential. You can improve the efficiency by 30 percent by moving from an energy efficiency ratio of 6 to an EER of 8. We have financed high EER appliances as well as insulation. I will come back to the response we have gotten from our customers in just a minute.

Two: We sponsored and built, in cooperation with the Rock Wool Association, the General Electric Co., the homebuilders associations, and two of the universities in our area, research homes in Beaumont, Tex., and Baton Rouge, La. These have been the focal points of improving the building standards of new construction in our service area.

Three: We have conducted a retrofit program in cooperation with the Economic Opportunity Commission office in Jefferson County in which we focused on low-income housing and how to decrease the energy waste in those low-income houses.

Four: We have initiated a research program with Lamar University, in Beaumont, to develop thermal storage air-conditioning equip-

ment which could reduce the peakload demand for air-conditioning use during the day and still maintain the cooling qualities that are essential in our area.

Five: Our company has run a test program in Conroe, Tex., that featured nighttime aerial infrared mapping of subdivisions to locate homes that waste energy for heating. This was completed last winter. We are making those maps available to the public in our Conroe office. This is a pilot program which we hope to carry out in the rest of our company as soon as we see what kind of response we are going to get in the test case.

Six: We have financed and constructed an energy efficiency exhibit which can be moved about our system. The exhibit is currently in a new community called The Woodlands, 20 miles north of Houston. This exhibit will be moved into shopping centers, schools, and other areas where public traffic is heavy. The display requires an area of about 8 feet by 15 feet, and consists of a mockup of a house and all of the features that can go into a house to make it more thermally efficient. This is one of our best programs, we think. ERDA and Texas A. & M. are cooperating with us in this program.

Seven: For many years we have offered equal billing to our customers, budget billing, whereby they pay the same amount throughout the year on an average basis of the total bill that has accumulated through the year.

Eight: We began an extensive program for schoolchildren to understand what is going on in the energy situation.

Nine: Recently, because we felt that public response to our activities was not living up to our expectations, we installed energy information centers in each of our major offices throughout our system. This has been done in cooperation with advisory boards in both Texas and Louisiana, which include a selected and qualified team of people in our region interested in energy conservation.

Representatives on our advisory board include a State commissioner for conservation, the dean of the architectural school at the land grant college, and the builders association of the area. This whole group works together. We think this kind of team effort is what is needed at this time rather than mandating requirements. We must educate the public as to what is going on; why they should prepare for the price increases that are yet to come in our region.

Why are we doing all of this as a utility? We are doing it because we now, as a gas-burning utility, have to convert to coal and develop nuclear resources in our service area. This is a very costly process. In the future, the faster our load grows, the greater will be the price increase to our customers. Our construction budget will have to be managed very carefully. Therefore, we set about this program of conservation to reduce our historical annual load growth from some 11.6 percent to something more on the order of 4 to 5 percent. We are currently working on a load growth of 4 percent per year. We feel like this is in the best interests of our consumers. It must be done by a program of extensive education and the involvement of all of our consumers in energy conservation. We have done it on a voluntary basis. We have done it with the involvement of the people I listed awhile ago: the homebuilders, the architects, the financial institutions which have been very cooperative in this.

We have developed new construction standards within our service area. This is something that must be kept in mind—new techniques for building new products. We have cut the air-conditioning load in a 1,700-square-foot house from 3 tons to 1½ tons in our research program. We can and will do more.

As far as financing, our financing of insulation has had very little use in recent months. In the last 6 months only $7,000 in insulation has been financed through our program. Why? Because the financial institutions are quite willing to loan money at reasonable rates. They have greater expertise in making consumer loans than we have. We have brought them into our program and they are cooperating. They have accepted this responsibility.

Senator JOHNSTON. What is the average cost per home?

Mr. GLASS. About $300. If you get into upgrading or changing out the air-conditioning equipment you will get in the $2,000 to $4,000 range. Remember the air-conditioning of homes began in the 1950's, so we are not far away from the renewal of that air-conditioning equipment.

Senator DOMENICI. You indicated you are not having to finance because the banks are doing this. What percentage of these expenditures are requiring financing?

Mr. GLASS. A very good point. Mr. Swanson has found the same thing. We find the availability of financing will motivate the customer to investigate. Then if he finds it is only a $300 insulation job, he will go ahead and pay for that rather than go through some financing process.

In a majority of cases, this is what our contractors tell us happens. We are working very closely with our insulating contractors. I want to also emphasize the point Mr. Swanson has brought out about the availability of materials and our time schedule for getting this job done which we all want done. We must take that into account.

I am quite sure, as far as our experience today is concerned, that the limiting factor on the time schedule that we ought to look at is the availability of insulation material. But the contractors exist in our area to do it. They are competent; they are cooperative with us and the other interested parties. The financial institutions exist and they are cooperative. We began educational programs for all of the financial institutions in our area several years ago as we saw this energy crisis developing.

We think shortly the interest rate for construction will take into account whether or not that home is designed for energy efficiency. We learned just recently that some differential was going to be made.

The Federal sector can be most helpful in the area of financing if it wishes to be active in motivating the public to do something. Your historical role in influencing the housing market has been in financing. Whether it should be some form of income tax treatment, or in a Government guaranteed loan, I cannot say. But I think that is the way the Federal sector can help motivate the consumer. That is where we are today. People are not moving fast enough. We have regrouped and gone into a more thorough educational program to bring this about.

It is in the vital interest of the management of our company to do it. We intend to do it regardless of what other sectors do.

Senator JOHNSTON. Thank you very much, Mr. Glass.

The CHAIRMAN. One of the things that bothered me is in the area of air-conditioning. For example, the low-cost units are not as efficient, but they are cheaper. They take a lot more energy. On the other hand, the more expensive units will save a lot of energy. How do we mandate or handle that kind of situation?

We want to leave some kind of choice, but then we get into the manufacturer's problem, the manufacturer of cheaper equipment obviously may not be able to compete with the large well-established well-known companies. But it really strikes at an important part of conservation.

Mr. SWANSON. I think some minimum standards ought to be set to solve the manufacturer's problem. If this is done on the State level they have the problem of meeting each State's requirements.

The CHAIRMAN. That is the problem. I think the State carrying out the standards are fine, but if you leave it to all of the States, the national manufacturer cannot be trying to comply with 50 different States' standards.

Mr. GLASS. Some standards need to be available. I think the people most knowledgeable about this are the ones who are going to be testifying from the ARI, which is the body for certification of air conditioning equipment. You have done that with cars. I believe you have set certain minimum standards and escalated that through the years. Possibly something like that could be done with air-conditioning equipment. There certainly is some room for improvement.

Some of the equipment that has been made available was purchased because we bought housing in this country on first cost—how much does it cost me to move in and how much per month does it cost me—not on the cost of owning that house in its total sense. That's why we have an educational problem on life cycle costing.

The CHAIRMAN. I just want to say, the industry, you folks will be available, not you folks directly but your association, for any information we need, you are right on the firing line for all this. We are not trying to be arbitrary, we are looking for some answers and to really get some push behind the conservation effort.

Senator DOMENICI. Mr. Fawcett, I particularly want to commend you for your testimony, and in particular for your comments as to how we may want to consider administering this program. It sounds easy to say we want to do this at the national level and use the major utilities as the focal point, wherever they may be.

If I understand you correctly, you are saying we ought to have each State set up a system under Federal guidelines that may or may not include utilities. You are suggesting that even if we wanted to insist that the utilities be in it, that they be required to set the standards and bring to their certifying process a delivery system that would be much broader and State-regulated under a Federal minimum umbrella.

Mr. FAWCETT. That is true. In Massachusetts we have set up an office and is the forerunner for a good energy office. That office is already working to some degree with our trade association on energy matters. It also works with the New England council and the utilities in the area. If that is going on today, it would be a relatively simple matter to work with that State energy office, set up guidelines, and have that office be the one to qualify people or companies to do the work.

I think your statement of it was excellent in the procedure I suggested. I think you have that very much in mind.

Senator DOMENICI. Would you envision in the larger States we ought to provide authority to have subagencies within the cities that would then work under State guidance?

Mr. FAWCETT. It might be necessary at the beginning, but I think you could do it certainly from three or four cities in a State. You would not have to have every little town in it. I think the guidelines, however, talking for New England, should not be on a State basis. They should be set up nationally and the States comply with those guidelines or you will have a hodgepodge in a situation where a dealer delivers, or utility operates, over a State border into two areas.

I don't know about utilities, but many dealers operate in two States and you would want the guidelines, or the standards, to be similar.

Senator DOMENICI. We have had a lot of testimony on how we are going to do this insulation work for poor people in this country who cannot afford it at all. There are various suggestions as to how that might be done. Have any of you had experience on this point with existing Federal programs or State programs for insulation of homes? Could you quickly describe what you find and any suggestions you might have?

Mr. GLASS. One of our representatives went to the EOC in Beaumont, Tex. He worked out a program where contractors, financial institutions, who have worked from this total program of ours, worked with EOC to target certain homes that had been inspected. Then a grant was made to make those improvements.

Senator DOMENICI. Who did the work?

Mr. GLASS. I am not sure whether it was do-it-yourself or done by a contractor, but it was supervised by local people who have expertise in this field.

Senator JOHNSTON. Thank you very much, gentlemen.

[The prepared statement of Mr. Glass follows:]

STATEMENT OF CHARLES D. GLASS, VICE PRESIDENT, CUSTOMER RELATIONS, GULF STATE UTILITIES

Mr. Chairman and members of the subcommittee, my name is Charles Glass. I am Vice President of Customer Services for Gulf States Utilities Company, headquartered in Beaumont, Texas.

I appreciate this opportunity to represent Gulf States at this hearing, which I hope will provide helpful input to the establishment of a rational, fair National Energy Policy, as quickly as possible.

In the course of my testimony, I believe it would be helpful to the panel to be aware that Gulf States serves about 417,000 residential, commercial and industrial customers in an area consisting of about 28,000 square miles along the Texas and Louisiana Gulf Coast. The climate of this area is temperate all year, with hot, humid summers and generally mild winters. I emphasize the climate conditions because a conservation program that is designed for our area might not be suitable for other parts of the nation.

The panel may also be interested in knowing that we began our conservation or "wise-use" activities in the early 1970's, because we began experiencing curtailment by our primary national gas supplier in Louisiana of gas under long-term contract to serve our largest electric power plants in that state.

This motivated us to get somewhat of an early start on our program.

The thrust of our conservation program is to help our customers prepare for the inevitable higher cost of energy, with the dual objective of holding down peak load growth, which eases the pressure of adding costly generating units, thereby helping us maintain affordable rates.

I believe you will find that, in most instances, the conservation program we are presently undertaking is in general agreement with the energy conservation provisions of the President's energy proposals.

INDUSTRIAL CUSTOMERS

Gulf States is fortunate to number among its industrial customers some of the major petrochemical complexes in the world. Approximately 60% of the electric power we sell goes to industrial customers. The importance of these customers to our conservation efforts is obvious.

We work closely with these customers to reduce all less-essential consumption of electricity. In addition, we work with them to shift demand to off-peak periods, such as at night and during the cooler weather.

Our industrial customers are aware of the impact of energy costs on product pricing, and are carrying forward comprehensive conservation programs of their own.

COGENERATION POTENTIAL

Petrochemical plants located in the Gulf Coast area because of the handy availability of many natural resources needed for the finished product. Abundant natural gas supplies were and are used extensively for both fuel and feedstock. With diminishing supplies of natural gas, it is of greatest value used as a chemical feedstock.

Gulf States is in the consulting stage with several industries, consultants and financial institutions, study the feasibility for undertaking additional co-generating units, whereby the venture would be jointly financed, coal-burning generating plants would be constructed within the industrial complex and process steam and electric power would be provided the adjacent participating plants.

This plan would have the dual beneficial effect of lowering Gulf States' peak demand and providing an additional supply of power for new customers and expanded use by existing customers.

Gulf States has been in the steam-electric business in the industrial complex just north of Baton Rouge, Louisiana for over 40 years.

COMMERCIAL CUSTOMERS

For many years we have participated with architects and builders in programs designed to produce energy-efficient buildings. Our current programs with these specialists intensifies the emphasis on the construction of energy-efficient buildings.

We have a computer program, called AXCESS, which enables us to provide builders with the amount of savings in energy and money that is available if certain energy-saving procedures are incorporated in a particular building.

In partnership with Lamar University at Beaumont, Texas, we are undertaking research to determine the feasibility of thermal storage cooling systems that could lead to less peak load usage of electricity, primarily caused by commercial and residential summer air conditioning. The agreement calls for Gulf States to underwrite for Lamar the cost of designing, operating and evaluating a system to store cooling capacity.

RESIDENTIAL CUSTOMERS IN EXISTING HOMES

Gulf States provides electric service to about 382,000 residential customers, representing a population of approximately one and a half million people, and natural gas service to some 75,000 customers, representing about 300,000 people in and around Baton Rouge, Louisiana.

A number of on-going consumer programs are included in our overall Conservation Policy to help these customers cope with rising energy costs.

Financing

Our company has a credit finance program for residential customers. For retrofit projects the customer may purchase heat pumps or high efficiency ratio (EER of 8.0 or greater) central air conditioning systems. We provide 48 months financing for these customers. This program creates an atmosphere for more efficient use of energy in comfort conditioning of homes and tends to improve the company's load factor by dampening our summer peak load growth.

Other items financed include insulation projects having at least minimum standards of R–19 in attics, R–11, in walls and R–13 under raised floors. Insula-

tion financed for the period November, 1976 through April, 1977 amounts to only $7,000. The public has not made extensive use of our finance program for insulation.

Low Income Groups—Retrofit Program

Gulf States is conscious of its responsibility to assist low and fixed income customers in coping with rising energy costs. The company works with the Economic Opportunity Commission of Southeast Texas to weatherize through caulking, weatherstripping, replacing broken windows, attic ventilation and attic insulation, the homes approved for this assistance.

Aerial Thermographic Mapping

On one of the coldest nights of the winter of 1976–77, the company engaged the Austin, Texas firm of Hazard and Associates to take aerial infrared photographs of the residential and commercial areas in Conroe and The Woodlands. Each structure has been analyzed as to its thermal efficiency by the evidence of heat loss clearly shown in the photographs. This pilot program enables Gulf States to assess the value of the process in targeting buildings that need thermal improvement and to check the energy efficiency of new home construction in the area.

Equal Billing

An equal billing plan is available to residential customers whose monthly bills average $20.00 or more. This program is especially apealing to budget-conscious customers.

RESIDENTIAL CUSTOMERS PLANNING NEW HOMES

Gulf States has been connecting 5–6,000 residential customers annually. Special conservation programs are available to these customers.

Energy Efficient Research Homes Data

Four Energy Research Homes have been constructed by the home builders associations of the Sabine Area of Texas and in Baton Rouge, Louisiana. Directing the construction of two homes in Beaumont, Texas, was the Texas A & M University College of Architecture and Environmental Design. In Baton Rouge, construction of the two homes was directed by the Louisiana State University Department of Architecture. Participating in these research projects were General Electric Company, Rockwell Industries and Gulf States Utilities Company.

These homes are designed to be practical, affordable and also provide lifestyle sources for careful research monitoring by the two universities. The project is expected to provide exact data for future incorporation of energy efficient features into homebuilding.

Housing Exhibit for Potential Homebuilders

Gulf States financed the construction of an energy efficient housing exhibit in cooperation with the Center for Energy and Mineral Resources at Texas A & M University. On display at The Woodlands, Texas, Information Center, the exhibit is a mock cutaway of a house, stressing energy conserving features. A videotaped message explains the four major areas of concern in building an energy-efficient home; efficient service systems (air conditioning, space and water heating), insulation, attic ventilation and air leakage. The exhibit can be relocated and will be displayed in the future at shopping centers, trade shows, and at financial institutions.

Energy Information Centers

Staffed Energy Information Centers are located in the display areas of Gulf States' five division offices. These centers are designed to demonstrate concepts for obtaining maximum energy efficiency using various types of materials and equipment. Brand names are avoided and vendor lists are made available to the customer. Included in the centers are Consulting Services for representatives of the construction industry, financial institutions, news media, related businesses and the public.

A continuing training program for personnel staffing the centers, conducted by the Architectural Department of Louisiana State University and Texas A & M University, will provide current information regarding new products and the latest research data available.

Energy efficient publications are offered the public free of charge. Samples of these and the "Project Conserve" program are available here today should you care to peruse.

In each state, an Advisory Board of recognized authorities in their respective professions will aid in the evaluation of products, materials and concepts for the information centers and to develop procedures to make them more effective. Serving on the boards are university educators, architects, builders, state government energy officials and utility representatives.

Communications

Gulf States' personnel work closely with school teachers, furnishing educational kits to teachers of science, economics and social studies to instruct future homemakers in the wise use of energy.

An aggressive Speakers Bureau of about 36 employees provides informative energy programs to company employees, civic clubs, schools, elected officials, and a variety of other groups.

I think you will agree that our programs to promote energy conservation are as extensive and imaginative as any in the country. We feel the program has been successful in influencing standards for new construction. However, we have not yet found the key to reach existing homeonwers and convince them they should retrofit their homes with energy saving measures.

We have examined our past activities, regrouped and are preparing a basic education program to persuade the public to retrofit. We have solicited the help of the colleges, homebuilders associations, state conservation committees and financial institutions to make the program broader based and more believable.

The problem was not in either having financing or contractors available. Our company offered financing and the various lending institutions in our area are anxious to make funds available. There are contractors to do the work.

The need is for educating the public about the energy situation, how prices are going to continue to rise, and what they should do to cope with the situation.

Herein lies the weakness of the proposed legislation. It seeks to mandate programs that are already in force. These programs as far as we know in our region have not caused a satisfactory number of consumers to take the desired action.

We believe the answer lies in a more thorough job of educating the public. We are doing what we can to educate the public in our area and we invite the assistance of anyone who wishes to work at the task.

Thank you.

Senator JOHNSTON. We will hear from Mr. White next.

Senator METZENBAUM. I hope you will give some consideration to mandatory alternatives you think you might provide, some solutions other than those presently being discussed.

STATEMENT OF LEE C. WHITE, CHAIRMAN, ENERGY POLICY TASK FORCE, CONSUMER FEDERATION OF AMERICA

Mr. WHITE. We will do our best, Senator. May I say, Senator Johnston, I don't think there are many experts in this field of conservation. I get the impression there isn't anybody who doesn't think it is a terrific idea, but from there on there is one mass of confusion as to how to proceed.

Unfortunately, I think our statement, like many other views of the Carter program, tends to emphasize the negative. I think Senator Metzenbaum is right. If there is some way to come up with a positive program—and there are many elements of it that we could not fuss with—we should do so. Let me introduce Ellen Berman sitting on my left who is the executive director of our task force and who works in many of these energy issues.

I gather my full statement can be incorporated in the record.

Senator JOHNSTON. All statements will be put into the record verbatim and will be read.

Mr. WHITE. Thank you. One of our basic gripes about the President's program is it puts great reliance on increased prices as a tech-

nique for conserving energy. There is some dispute as to how elastic the demand is with higher prices, especially when you come to some of the more major uses of energy. I don't think we can deny there is some impact.

We would prefer the Congress, when it is done with this aspect of conserving energy, will not have accepted and relied heavily on the notion that higher prices are better than lower prices because over the long run it discourages consumption.

First of all, we have to live through the short run. Second of all, there is concern on the part of consumer, labor, and other organizations as to what happens to the profits. There is a problem here of national acceptance of an energy program. To the extent it appears the burdens fall unequally, and there are those who are unjustly enriched by the program, it is very difficult for the American public to accept as a fair and equitable program.

Although the President wants it to be equitable and everybody else does, what we are talking about is when you get right down to it and when that legislation is written in this committee, we hope as representatives of consumer groups there will be some sensitivity to the need to handle this problem of equity and fairness. In the President's energy plan, for example, a 100-page document, it states that the administration is concerned about the impact on the poor segment of our society and we are preparing and will submit forthwith our program to aid people at the bottom who are undoubtedly going to be hit hardest, but as yet nothing has come forward from the administration.

Those of us who frequently look in that direction for our sense of the attitude of the administration hope that Congress itself will focus on those questions. Some of them popped up in questions to the earlier panel.

To get briefly to the questions on conservation, the subject of this hearing, when it comes to the gas-guzzler automobile, every one is opposed to it.

Senator JOHNSTON. Can you zero in on the conservation in homes, schools, that sort of thing?

Mr. WHITE. We have watched the FEA weatherization program and the Community Services Administration program. Right now, if my recollection is correct. Community Services has an $88.5 million budget for that purpose. We think it makes more sense to centralize those functions and would recommend the FEA aspect of it be transferred to the CSA.

The CSA has in place 800 community action agencies. Presumably they know where the ghettoes are, they have developed the techniques for reaching the poor. Part of the problem we have identified is the difference between the perception of the national program and people down in the streets of Cincinnati—I served on an advisory committee with a woman from South Milwaukee, a woman who did not quite understand the difference between a kilowatt-hour and 1,000 cubic feet of gas, but she certainly understood the utility bills that were coming and was able to demonstrate the need to have individuals at that level able to tell people about the benefits of insulation and how some of these programs could be implemented.

In short, CSA strikes us as a great deal better bet than the FEA effort up to now. The tax credit is the tricky one. I am convinced

from what I have heard that people ought to be doing this and are doing it. It does not make a greal deal of sense to give a tax credit as an inducement particularly since that tax credit goes only to the middle and upper levels.

Senator JOHNSTON. What about Government-guaranteed loans?

Mr. WHITE. That is different and that makes more sense. We would support the Government-guaranteed loans presumably even at a subsidized level at less than the going rate. Guaranteed loans are, I think, a tested technique for the Government to use in achieving such an objective.

We like the idea of stronger and more mandatory requirement for new building construction and also, for the retrofitting or the bringing up to snuff of the established buildings we already have in this country.

As is always the case, there is nothing that does not have side effects or ripples. We are already getting nervous about the home insulation business, not only the people who produce the insulation, but those who actually apply them. The Federal Trade Commission, I think, has already begun to take a look at whether or not the relatively small number of producers—I believe there are only three major producers of home insulation in the country—are a factor in prices having shot up with the strong demand for insulation.

I do not now have a recommendation that the Federal Government ought to induce others into that business, or the business ought to be expanded, but we certainly identify that as a problem that ought to be examined. I gather from what I have been told, the Federal Trade Commission is already alert to this and is undertaking to do something about it.

I could not help but listen to the discussion you had with the utility people from the energy industries, as to what role they ought to play. There is a concern, and I think it is a legitimate concern, that the utilities will not necessarily be fairly competitive and because of their great strength they will push out smaller business establishments.

It occurred to me they could be used, perhaps, in a technique that makes them a last resort, or, as you have suggested, that they be used for identifying what has to be done in the homes in the communities they serve. But for the most part they will reach the bulk of our population. The utilities I have worked with myslf, most of them privately owned, are not wildly enthusiastic about the program.

They see in it the potential for criticism. Quite frankly, they would have to deal on a contract basis with people in the home improvement business. I am sure this is not universal across the board, but by and large people in that business have not inspired a great deal of confidence in this country.

Utilities tend to guard their reputation and images, and they should, and they are nervous about the quality of work that would be done and all of the abuse and criticism would be directed to them.

The gentleman from the fuel industry had some good points. There can be no doubt simple changes of equipment for the burning of natural gas which are not expensive, no more than $15 or $20 including installation that could make a tremendous difference in the amount of natural gas that is wasted. There is no reason that cannot be done.

One approach the utilities have contemplated—an interesting idea—is that natural gas that is found in the attics of homes poorly insulated is cheaper than the gas they have to go out and discover in the Gulf of Mexico or the Atlantic or down in Louisiana. The theory goes, if it is cheaper to insulate a home and thereby have available to the company the gas that would be saved than it is to go out and buy new gas, why not have the utility simply do that for nothing to the customer?

Let them make an investment in insulation as a technique for acquiring gas. There are some utilities who will look at this and say, I can only sell that gas one time. If I am not selling one-fourth of it to homeowner A, maybe I will have to sell it to homeowner X and I will not make any more money on it. But it is one of the theories being considered.

I know the State of Pennsylvania has looked closely at whether or not it will permit its utilities to pay total expense for the insulation of the homes simply in order to acquire the natural gas, so long as it would stay in that particular district, kind of a "finders-keepers" that would be applicable to the gas.

Senator JOHNSTON. I hate to cut you off on your testimony, it is very excellent, but I will have to ask you to summarize.

Mr. WHITE. I think I have already told you more than I know, Senator.

[The prepared statement of Mr. White follows:]

STATEMENT OF LEE C. WHITE, CHAIRMAN, ENERGY POLICY TASK FORCE, CONSUMER FEDERATION OF AMERICA

My name is Lee C. White, and I am here today in my capacity as Chairman of the Energy Policy Task Force of the Consumer Federation of America. Our Task Force has 30 member organizations (Attachment A), and our expressed purpose is to ensure that the consumers' views are included and considered in the energy policy debates currently taking place, and, in particular, within the Congress. We recognize that there is no necessary single "consumer interest" in any of the numerous issues that comprise the energy policy debates; nevertheless, we have undertaken to do the best job possible in assessing and stating the views of the consuming public and, as the broad base of our membership suggests, we do indirectly represent millions of Americans.

President Carter has stated that "The cornerstone of the National Energy Plan is conservation, the cleanest and cheapest source of new energy supply." The Energy Policy Task Force is delighted that the President has given credence to this critical issue. The need to conserve energy is vital, both in terms of preserving the environment and in reducing energy costs. There are estimates which conclude that one-half of the energy used in this country is wasted, but could be saved by conservation measures.

The objective of a nationwide energy conservation program should be the efficient consumption of energy. While President Carter's National Energy Plan recites the importance of energy efficiency and the need to conserve our energy resources, his Plan calls for programs for which consumers will bear the heaviest burden and for which the energy savings will be minimal.

President Carter has called on the nation to make sacrifices in achieving his energy goals. While the Energy Policy Task Force agrees that many changes in the way energy is consumed must take place, it is not clear nor is it necessary that citizens will have to make a great sacrifice to become less wasteful. For example, is it a sacrifice to switch from automobile getting 12 miles to the gallon to one getting 35 miles per gallon? Or is it a sacrifice to burn less energy to heat a home to the same temperature with the benefit of insulation? Or is it a sacrifice to re-use bottles or to recycle what is now considered to be "garbage"? These are changes in style, not the substance of living. The call to the nation to use energy more efficiently involves changes in perceptions and values, but

not necessarily in the standard of living. In fact, energy conservation could well improve that standard by reducing various forms of pollution, for example.

Although played down, there will be sacrifices if the President's program for higher energy prices is adopted. The President has chosen to increase energy price levels in an effort to decrease energy consumption. Higher energy prices, as we have seen, have a particularly adverse effect on the economy, as a whole, and on middle and low-income, poor and fixed income families, in particular. While the President embraced the goal that sacrifices would be shared fairly and equitably among all segments of the society, implementation of his Plan, in our view, would have a regressive impact on poor and low income families, and would even cause additional hardship to those in middle income groups.

President Carter's conservation proposals are, in essence, extensions or modifications of programs already passed by Congress. They involve decreasing the use of energy in the nation's automobiles and in the nation's buildings which together require 62% of the nation's energy. Thus, increasing the energy-using efficiency of automobiles and of residences and other buildings can have a significant impact on the nation's energy budget. Yet, there are alternative routes which can be utilized to arrive at the same goal.

AUTOMOBILE TRANSPORTATION

With respect to the automobile, which one study has found, consumes 21 percent of the nation's energy (Eric Hirst and Robert Herendeen, "Total Energy Demand for Automobiles," Society of Automotive Engineers Publication 730065, 1973), the President's Plan would place a tax on so-called gas-guzzling cars; provide a rebate on energy efficient cars; provide a standby gasoline tax for excessive consumption; and will increase gasoline prices due to higher crude oil prices and taxes. In short, the President would make driving an inefficient or gas-guzzling automobile very expensive. It is the underlying assumption of this approach that people will not want to pay an additional tax; that they would prefer a rebate when purchasing an efficient automobile and that higher gasoline prices will force people to exchange gas-guzzlers for energy efficient cars and/or drive less. These assumptions, in our view, are highly speculative.

In the first place, with respect to gasoline prices, the European experience has demonstrated that small increases in the price of gasoline have only slight affects on gasoline consumption. The experience in this country has been similar. Demand for gasoline is very inelastic, and significant decreases in consumption would require quite hefty increases in price—upwards of 50 to 75 cents per gallon. The President's Plan does not recognize that a large proportion of driving, given the growth of highways and suburbs, is used for commuting and that alternatives, such as public transportation, are minimal or non-existent. Moreover, and more importantly, the President's Plan is seemingly unaware of the differences that exist among families with varying incomes and their responses to higher gasoline and automobile prices. In short, the more money a family has, the more likely it has one or more cars, and the more likely it is to drive that car or cars more, and thus consume more gasoline. Poor and low-income families that do own cars usually own used cars which are likely to be the most inefficient in the national fleet. Higher gasoline prices will impact especially hard on these families, who already are feeling the burdens of the increases that have taken place since 1973–74, and given the likely increases mentioned above, in addition to gasoline decontrol (another Presidential proposal).

The President's proposal would still allow those families with sufficient income to purchase gas-guzzling cars. A 1973 study for the Ford Foundation Energy Policy Project indicated that well-off and upper-middle income families, while constituting 40% of all households, consume 60% of all gasoline. In 1973, 47% of poor families and 16% of lower-middle income families had no car. Sixty-one percent of upper-middle income and 78 percent of well-off families had two or more cars. Clearly, even with the President's proposed rebate proposal, higher gasoline prices will impact more adversely on low-income families, especially those in rural areas of large states who may have to travel long distances to get to work or to purchase goods and services.

In our view, a more equitable approach would consist of the following:

(1) An outright ban on gas-guzzling cars, with the standard of efficiency being raised every year;

(2) Increased subsidies for intra and intercity public transportation;

(3) A user tax on inefficient vehicles to be imposed after a certain time period, say three years, which would increase each year, and to be paid at the time of registration and the money to be used to expand or maintain mass transportation;

(4) Parking bans; express bus lanes; bicycle lanes to discourage automobile use.

Most of these suggestions do not rest on higher prices to discourage reliance on inefficient automobiles, but would operate to discourage automobile inefficiency and use and encourage public transportation. We hope the Committee will consider these suggestions.

RESIDENCES AND BUILDINGS

The President's proposals with regard to conserving energy in buildings focuses primarily on residences which "contain no more than two dwelling units." Apartment house conservation is left to the landlord to decide. The advantage to a landlord under the Carter Plan would be to take advantage of a 10% investment tax credit. Yet, it is likely that tenants will be stuck with the added costs in their rents, especially if the modifications are expensive and the energy savings are not sufficient to meet the added costs. In any case, the Carter Plan would permit homeowners tax credits toward the purchase of energy conservation materials or solar energy technology. For low-income families, the President provides additional appropriations for the weatherized program administered by the Federal Energy Administration. He would also move up the date by a year (to 1980) when the Secretary of HUD must come up with mandatory efficiency standards. Local utilities (both public and private) would provide homeowners with estimates as to the need and cost of improvements and with access to loans and local contractors.

While the President's program would increase substantially the funding for the FEA's weatherization program, there are serious flaws in the way the FEA has administered the program thus far. While providing grants to qualified low-income families, the FEA does not permit these funds to be used for labor, tools, equipment and transportation costs. Thus, many low-income families can get weather stripping or insulation, but may have no means of installing it. A far better program is being administered by the Community Services Administration. Its grants are larger and cover costs not covered in the FEA's program. According to a recent Library of Congress study, "While the FEA program focuses only on weatherization, the CSA has a more general mandate to help low-income families reduce energy costs by such methods as education, legal assistance as well as weatherization of homes." We recommend that increased appropriations be given to CSA and that FEA's weatherization program be transferred to CSA to administer.

With respect to the tax credits proposed by the President, it was reported in the Library of Congress study that:

"One industrial insulation firm estimates that during the last two and a half years and without any government subsidy, as many as 8 million homeowners have added to existing home insulation. Under the program, 8 million homeowners claiming the full tax credit of $410 would have cost the Federal Government $3.3 billion in lost revenue."

It would appear that a closer look must be given to the President's proposal. Exactly what income groups of homeowners are going to take advantage or would have the opportunity to take advantage of this program?

Since well-off and upper-income families are likely to insulate their homes anyway, it seems to be a waste of taxpayers money to provide tax credits for this purpose. It would be more effective for the Government to set up a Conservation Bank which would provide low-interest (3%) loans to families not covered by the weatherization program and families whose income does not permit them to make the initial conservation investment. Moreover, conservation efforts, instead of being voluntary as in the Carter Plan, should be made mandatory in a fashion similar to the legislation passed by the House Subcommittee on Energy and Power. This provides that by a fixed date no houses can be sold unless they meet certain energy conservation standards.

We also recommend that the mandatory efficiency standards to be proposed by the Secretary of HUD by 1980 contain the following items for new housing and building construction:

1. Mandatory insulation for ceilings, floors, and walls in all new homes and buildings.

2. If new homes are built with electronic heating—heat pumps must be mandatory.

3. Storm windows must be part of all new homes as well as windows that can be opened and that reflect radiant heat must be included in all new commercial buildings.

4. Orientation (relationship of buildings to sun and prevailing winds) must also be included so as to conserve energy.

5. Lighting standards in commercial buildings must be changed to provide for the use of fluorescent rather than incandescent lighting.

Part of the growing waste in energy usage has resulted from building contractors moving towards more energy-intensive housing with respect to both single-family homes, apartment houses and commercial buildings. If this trend can be reversed through the use of strict conservation requirements in new buildings, efficiency in home and commercial use of energy can be increased significantly.

We also recommend that heat pumps be included under the term "residential energy conservation measure", since these devices have shown, in the case of electrically heated and cooled homes, to result in significant energy savings.

We also believe that the President's program for increasing the use of solar energy systems in homes could be substantially broadened, given the fact that a number of studies now find solar heating to be economically competitive with other forms of heating systems.

We suggest that included in the efficiency standards proposed by HUD in 1980 be requirements that all new housing construction include solar heating devices. While such units are likely to increase the initial costs of new homes somewhat, there should be a Government program to provide families with low-interest loans to encourage such home buying. The program should also make such loans available to families who wish to retrofit their homes with such units.

RESIDENTIAL INSULATION PROGRAM

We have misgivings concerning some of the possible consequences of the President's home insulation recommendations. Currently, only three companies manufacture fiberglass insulation. The potential for monopoly profits in this industry is high. In this regard, it is important to note that in 1975 while shipments of insulation decreased by 5.1 percent because of the general economic slump which hit home builders especially hard, the price increased by 18.5 percent. It is essential that consumers be protected—one approach is for the Federal Trade Commission to begin an immediate investigation of the fiberglass manufacturing industry to determine whether or not there is workable competition so that prices will reflect the marginal cost of production and not be inflated by monopoly power. Moreover, an insulation price monitoring system should also be instituted.

We believe that allowing utilities to have increased involvement in providing consumers with evaluations, loans and insulation should be carefully considered. The decision of the House Subcommittee on Energy and Power to limit the utilities to evaluating conservation requirements, providing long-term loans and insulation in remote areas and where they would not threaten competition makes sense, but there may be situations in which the program will not be undertaken by others. Perhaps a "last resort" approach could be initiated to be monitored by state regulatory bodies. The role of utilities in the insulation business could have serious economic consequences for both small businesses and consumers, and should be subject to careful scrutiny by Federal and state agencies.

Additionally, we are informed that there have been recent efforts on the part of some utilities to get into the solar heating business. Because of their other interests and their need to increase their rate base, utility efforts in the solar area could be a threat to an independent solar industry. While solar heating should be promoted vigorously, serious questions need to be asked with respect to utility involvement as to whether or not their interest will promote or retard the swift development of this new industry so critical to serious energy conservation efforts.

In addition to the problems of competition in the insulation industry, investigations by the House Subcommittee on Energy and Power reveal serious supply and manpower constraints in insulation. With increasing demand in both new housing construction and the retrofitting markets, serious supply problems could develop which could short-circuit the nation's efforts at conservation. These supply constraint problems should be examined.

PROSPECTS FOR CONSERVATION NOT MENTIONED IN CARTER PLAN

The President, to be sure, has focused attention on the largest sectors of energy waste. But there are other areas where significant energy savings can be realized. One of these is in the production, processing, packaging and transportation of food, which, according to a recent Library of Congress study, accounts for approximately 16.5 percent of U.S. energy use. The food industry has become highly energy-intensive: from the use of energy-intensive fertilizer to the use of irrigation and drying; from the increased use of packaging to more energy-intensive refrigerators. The Carter Plan makes no effort to address this area of energy waste.

The use of waste for fertilizer and solar energy for irrigation and crop-drying are both technologically feasible. Legislative efforts to promote these technologies should be vigorously pursued. In addition, the Plan offers no proposals with regard to recycling efforts, or the use of garbage to generate electricity or methane, or as a substitute for fertilizer. With a strong Federal commitment in this area, large energy savings are possible. According to Denis Hayes of Worldwatch, "Our annual production of organic wastes totals about 700 million dry tons, containing over 11 quadrillion Btu's or approximately one seventh of our entire national energy budget. Of this, more than one quadrillion Btu's is contained in urban garbage." Hayes also points out that "At least seven million tons of iron, 400,000 tons of aluminum, and 100,000 tons of copper could be economically recovered and recycled with a net savings of about 400 trillion Btu's. These figures exclude metals found in building demolitions and scrapped automobiles."

REGRESSIVE IMPACT OF HIGHER ENERGY PRICES

While we believe that a strong conservation program must be implemented, we are doubtful that it can be accomplished in a fair and equitable manner by relying primarily on higher energy prices to restrain consumption. We must point to the fact that the higher energy prices of 1973–74, 85% of which was due to higher *domestic* prices for oil, natural gas, coal and uranium, had a considerable adverse impact on the American family. While the President proposes rebates for some of the additional taxes collected, many of the increased costs of energy contained in the Plan will not be returned to the public. The proposed increase in crude oil prices, the increases in natural gas prices, the probable increases in coal and uranium prices—will all be passed through to the consumer level in higher heating oil, natural gas, and electricity bills. In addition, the industrial and utility consumption tax which, for the 1979–1985 period may amount to $90.5 billion, will not be rebated to consumers. Moreover, gasoline price decontrol may cost $36 billion over the 1978–1985 period. It is important to note that energy prices in the United States increased *62 percent* between 1972 and 1976. Under the President's Plan, energy prices would increase *74 percent* between 1976 and 1980. At a minimum, such increases threaten another round of inflation and recession. These higher prices seriously affect the real disposable income of consumers. These higher prices force many middle, low and fixed income families to pay a higher percentage of their income for heating bills, electricity bills, gas bills, gasoline bills, and other direct and indirect energy expenditures. The President has not provided sufficient indication as to the impact his program will have on these families. We submit that higher prices are the most regressive method of reducing energy consumption. Energy waste can be eliminated without resorting to the use of higher prices. Mandatory standards can be used to ensure that energy conservation can take place throughout the economy without affecting economic growth.

ENERGY POLICY TASK FORCE MEMBER ORGANIZATIONS

Adams Electric Cooperative, Inc.
AFL–CIO.
Allegheny Electric Cooperative, Inc.
American Federation of State, County and Municipal Employees, AFL–CIO.
American Federation of Teachers, AFL–CIO.
American Public Gas Association.
American Public Power Association.
Consumers Union.
Cooperative League of the USA.
Industrial Union Department, AFL–CIO.

International Association of Machinists and Aerospace Workers, AFL–CIO.
International Brotherhood of Electrical Workers, AFL–CIO.
Kansas Municipal Utilities.
Lincoln (Nebraska) Electric System.
Maritime Trades Department, AFL–CIO.
Minnesota Farmers Union.
National Farmers Organization.
National Farmers Union.
National Rural Electric Cooperation Association.
North Dakota Farmers Union.
Northeast Missouri Electric Power Cooperative.
Northeast Public Power Association.
Northwest Public Power Association.
Oil, Chemical and Atomic Workers International Union, AFL–CIO.
Pennsylvania Rural Electric Association.
Service Employees International Union, AFL–CIO.
South Dakota Farmers Union.
Tennessee Valley Public Power Association.
Textile Workers Union of America, AFL–CIO.
Tillamook Peoples Utility District.
United Auto Workers.
United States Conference of Mayors.
United Steelworkers of America, AFL–CIO.
Washington Public Utility Districts' Association.
Wisconsin State AFL–CIO.

Senator JOHNSTON. Mr. Bossong.

STATEMENT OF KEN BOSSONG, COCOORDINATOR, ENERGY PROJECT, CENTER FOR SCIENCE IN THE PUBLIC INTEREST

Mr. BOSSONG. The Center for Science in the Public Interest is committed to a mandatory Federal energy program and we support sections B, C, and G of the administration's bill, but we do not support the mandatory provisions for utility involvement in insulation programs. I will try to outline some of the reasons for our nonsupport and offer alternative proposals.

We believe utility involvement in home insulation programs could result in suppression of competition among certain segments of the insulation industry by utilities. There is one instance we are aware of where a utility had undertaken an insulation program and has begun to force out of business the independent contractors and minority-owned businesses which normally sold insulation in that area; that is in Boise, Idaho.

Currently there are very few businesses in the insulation market. Utility involvement would tend to discourage new businesses from entering this market. If, State regulatory commissions are directed to guard against anticompetitive practices as the bill proposes, that would necessitate substantial increase in the budgets of the commissions. Most commissions outside a few of the largest States do not have staffs or budgets to handle competition problems.

A second problem is it may result in excessive profit taking and excess costs for consumers. If the program is instituted along the lines of the Rosenberg plan as suggested by FEA it would guarantee utilities a rate of return of 17 percent for insulation projects. That is a higher profit level than normally allowed to utilities.

Currently not all State regulatory agencies consider insulation programs to be subject to their regulation. We are presently conducting

a poll of State regulatory commissions. At least one commission, Maryland, has stated they don't see these insulation programs as under their jurisdiction.

A third problem is a question of equity. If a utility undertakes an insulation program, the cost would go into the rate base of the utility. That would mean all customers, including those who have already insulated their homes, would be paying for those who have been less conscientious in the past. Is this fair?

There is one example in Washington, D.C., where the insulation program offered by the utility, Washington Gas Light Co., is more expensive than that obtained by going to local banks. Another major problem, utilities have one of the most coercive payments system of any institution. They can cut off the gas and electricity service if the insulation part of the utility bill is not paid for. I don't believe there are provisions in the Senate bill to guard against this.

A third problem I see with utility involvement is a lack of accountability directly to consumers by the utility. Private, investor-owned utilities are responsible to the consumers only through the State regulatory commissions, intervening in regulatory commission proceedings is expensive, time consuming, and complex.

Most people mistreated by the utility could not afford the time and expense to intervene. Most consumers consider utilities bad guys. There are, however, a number of alternatives we see as preferable. Those communities that have municipal utilities would be better off using municipal utilities. Municipal utilities are smaller, more responsible to the public and do not have the same profit motive a public utility has. A number of municipal utilities are already involved in insulation projects that are highly successful.

A good example is Santa Clara, Calif. A second option would be for communities to set up community co-ops. This proposal was offered by Senator Kennedy in the Energy Conservation Act of 1976.

A third option is to rely on the insulation companies themselves. A model for this might be that underway in Ocala, Fla., where a solar company is providing loans for leasing solar components for residences.

A fourth option, the one we prefer, is a vast expansion of the Federal weatherization program, relying more heavily on CSA rather than FEA. The bill's proposal to increase weatherization funds is good but we believe it should be expanded. We have doubts about the tax credit system since it will discriminate against those consumers who cannot benefit from them.

The more general proposal is rather than have the Federal Government mandate a certain approach to insulation, rather than have the Federal Government mandate a goal, each State must achieve by a certain date, allow the States to use their own ideas, their own innovative approaches, to achieve that goal.

The States feel this can be done through means other than utilities. If utilities are to be involved, however, the bill should be amended to provide for one protection against arbitrary cutoff's of service.

Senator JOHNSTON. Mr. Bossong, let me cut you off there and go to the next witness. I have read your statement in full. We do want to allow some time for questioning all of the witnesses.

[The prepared statement of Mr. Bosson follows:]

STATEMENT OF KEN BOSSONG, CO-COORDINATOR, ENERGY PROJECT, CENTER FOR SCIENCE IN THE PUBLIC INTEREST

On behalf of the Center for Science in the Public Interest, I would like to thank the members of the Committee for this opportunity to discuss the National Energy Conservation Policy Act. We are a non-profit research organization that has worked in the areas of energy policy, environmental protection, and various consumer concerns for more than six years. This bill touches a number of energy questions of particular interest to us.

We have long endorsed mandatory federal actions to promote the conservation of energy supplies. We therefore support the general goals of this legislation and of President Carter's National Energy Plan. However, we also believe that the proposed conservation measures fall far short of the actions that could and should be taken in the near future.

Regarding the bill before this Committee, we support generally the provisions of Part B (Energy Efficiency of Consumer Products), Part C (Energy Conservation Program for Schools & Hospitals), and Part G (Federal Vanpooling & solar initiatives). However, we strongly oppose the proposal for mandatory involvement by investor-owned utilities in residential insulation projects (Subpart I of Part A—Utility Energy Conservation Program for Existing Residential Buildings).

Our reasons for opposing this proposal include: (1) possible monopolization of segments of the insulation industry by utilities, (2) higher costs for these services would be borne by consumers, (3) the conflict of interests between conservation programs and private utility interests, (4) negative public reaction to utilities promoting insulation measures, and (5) the availability of viable alternatives. I will devote the bulk of my statement to the first portion of the bill and discuss each of our concerns individually.

Monopolization of segments of the insulation industry by utilities.—Utilities could swiftly establish a new monopoly in an otherwise highly competitive insulation market. It is not likely that a utility could lessen competition among fiberglass insulation manufacturers since there are presently a relatively small number of companies (most fairly large) in this field. However, large purchases from these big companies by the utilities could make it economically unviable for small business concerns to enter the field as future demand for insulating materials increases.

Moreover, utility installation of insulation could endanger small and minority owned or independent contractors that normally do such installations if the utility company undertakes to perform all the work itself. This concern has already been voiced by the Federal Trade Commission (Robert B. Reich—Assistant Director for Evaluation in FTC's Consumer Protection Bureau): "The utilities have access to every home and thereby are going to have an advantage over every other contractor".

This problem has already manifested itself in Boise, Idaho where a number of independent contractors have filed an anti-trust action in federal court against the Intermountain Power Company. That utility established a fully-owned subsidiary, Home Guards System Inc., to install insulation in the homes of its residential customers. The plaintiffs are charging that the subsidiary is improperly using the utility's personnel and funds to provide unfair competition to the contractors who had heretofore handled most insulation contracts in the area.

While it is true that the proposed bill seeks to "prevent unfair, deceptive, or anti-competitive acts or practices" (Sec. 102(d–2)), we doubt whether this can be fully enforced. It has been argued by Administration spokespersons that many of the problems entailed with a utility insulation program could be rectified through appropriate regulations enacted by the state regulatory agencies. This argument, however, glosses over the fact that all but perhaps a half dozen state utility commissions are seriously hamstrung by a lack of adequate funding and staff. Even with federal support, it is dubious whether most state commissions could adequately monitor the utilities in their states to guard against monopolistic practices.

Excessive profit-taking and higher costs to consumers.—Under most proposed insulation schemes, the utilities involved would be in a position to realize a substantial profit. For example, the FEA's so-called "Rosenberg Plan" proposes to provide utilities a return factor of 17% for customer insulation programs. That is substantially higher than the usual profit margin allowed utilities for other services by state commissions. An additional hitch is that insulation equipment

would become part of the utility's rate base which is used to calculate its guaranteed profit. In conjunction with likely rate increases to pay the costs of equipment installation, such a program would greatly boost utility revenues.

Homeowners could be lulled into complacency by thinking that state public service commissions regulate all charges by a private utility. But insulation is not necessarily a regulated part of their business. Maryland Public Service Commissioner Michael D. Barnes, for example, recently commented: "We don't set the rates for their (the state's utilities) insulation programs". While the bill touches upon this issue (sec. 102 d–4), the provision is so unspecfic as to leave ample room for abuse by the utilities involved.

Having utilities install insulation brings to issue, also, the equity of requiring large numbers of gas and electricity customers who have already initiated conservation activities through other utility programs or by personal investments to pay through rate increases the costs associated with the program. That is, those who have already installed insulation in their homes and incurred the expenses entailed would be forced to subsidize the installation of such materials in the homes of people who were less energy conscious. Moreover, as the utilities move into the insulation field, they will justify investments in these areas as warranting increases in overall utility rates—the increases to be used to cover alleged increases in administrative costs as well as other suspect expenses.

In addition, the Federal Trade Commission (again Robert Reich) has recently warned that "The (i.e. utilities) could charge higher prices and get away with it because people wouldn't do the kind of comparison shopping they should." Such one-stop shopping at a utility may prove convenient but could also prove dangerous to the consumer's pocketbook. For example, in the Washington, D.C. area, the Washington Gas Light Co. charges 14.55% interest a year on an insulation contract. But a homeowner who qualified for one of the 12% loans available at many Maryland and D.C. banks could save $20 on financing alone for a typical job.

The FTC also has pointed out that utilities should not be in the insulation business because they have "potentially the most coercive debt-collection technique in the world"—they could cut off a customer's gas or electricity if he fails to pay the part of his bill that covers insulation. The proposed bill makes no provisions to guard against this possibility.

Lack of accountability of the utilities to their customers.—There is effectively no accountability by large investor-owned utilities to their customers. The utilities have an essentially captive market; in most communities, there is only one company and thus a consumer has a choice between that company or having no gas and electricity at all. Thus, the lack of competition gives the utilities little incentive to seek to be responsive to the needs or wishes of their customers if those needs conflict with the utilities' own goals (usually maximization of profits). The only way customers can effectively impact a utility's policies is through a rate hearing before a state regulatory commission. However, such proceedings are complicated, time-consuming, and very expensive—making them unviable for most consumers, particularly those who are not organized. Nonetheless, utility consumers will have a vested interest in such insulation program related issues as: (a) price, (b) structure of rates, (c) competition in the marketplace, and (d) employment opportunities. Accountability is vital in any program that can have a major impact upon future energy directions the nations chooses to chart for itself. However, the proposed bill provides few provisions to insure such accountability by the utilities to their customers.

Social/Political/Ethical Considerations.—Utilities have a built-in conflict. Insulation depresses their sales. Basically, utilities do not see energy conservation as we do—namely as an alternative to building more power plants. Rather, the proposed insulation program will be implemented by the utilities in whatever manner they can—either legally or illegally—to sustain and increase profits.

Placing control of insulation efforts in the hands of the utilities is to entrust the nation's energy future to the same decision-makers who have given the U.S. nuclear reactors, plutonium breeders, polluting coal plants, coal gasification facilities, all-electric homes, and inverted rate structures. In essence, the nation's energy future is being entrusted to the same people who have done such a poor job to date of anticipating and responsibly responding to the nation's past energy needs. It is no wonder that Americans generally rate utility companies low in their esteem—possibly only the oil companies are more vilified.

A major consequence of the low esteem in which the American public generally holds the utility industry is that the industry will tend to taint any

program in which it is a a major player. Through no fault of its own, conservation will fall victim to a case of guilt by association if the American public views insulation measures as being an extension of the industry. Inasmuch as a major barrier to residential conservation is consumer acceptance, it would seem inherently unwise to hobble insulation efforts by placing them in the hands of utilities and thereby undercutting its credibility with the American public.

There are viable alternatives to utility involvement.—The primary argument in favor of involving the nation's utilities in insulation programs has been that there are no viable alternatives if the goal is rapid and efficient implentation of residential conservation techniques. This, however, is not necessarily true. There are other options.

For example, those communities owning a municipal utility could rely upon it for insulation programs. Unlike an investor-owned utility, a municipal utility is (in theory at least) far more accessible to the public; it is a public entity subject to direct control by publicly-elected officials. Municipals do not have the same profit motive and thus would be less likely to charge customers inflated prices for the installation of insulation. A number of municipals, such as that in Santa Clara, CA have insulation or solar retrofit projects underway that could serve as models.

A second option would be to have the city governments themselves establish community co-ops (perhaps with the assistance of federal seed monies) that could purchase large quantities of insulation materials and use community services such as CETA to install it. Local residents would purchase the insulation and installation services at cost (plus fee to cover administrative costs); the price would be lower, however, than it would otherwise be because of the economies of scale realized in such large bulk purchases. Such a program was advocated by Senator Kennedy in the 94th Congress when he first introduced the Energy Conservation Act of 1976 (S. 2932).

A third option is to rely upon the industries and businesses themselves that are manufacturing and installing insulation to institute leasing programs (possibly in coordination with local banking firms). This could be modeled on the solar leasing project now underway in Ocala, Fla. where a private solar company is leasing units to local residents. Such an approach eliminates the "middle man" (i.e. the utility) and should reduce costs to the consumer.

A fourth option would be to fund the 800+ presently-existing Community Action Programs (many of which are already involved in insulation projects) to broaden their programs to include all residents of their communities and not just the low-income. It is true that the bill provides for a significant increase in the funding of federal weatherization efforts (sec. 115). However, this assistance is just a drop in the bucket and could easily be absorbed by poor homeowners with many other poor and middle-class homeowners left unaided. Morever, most renters would be left unaided.

At this point, it is necessary to digress slightly and note that the government cannot effectively intervene on energy affairs without tackling inequities of income distribution. Beyond the weatherization program, the Administration and the Congress are relying upon tax credits to speed up the process of insulating homes. However, tax credits benefits people in higher tax brackets more and completely deals out people who are too poor to be taxable.

The tax credit plans now being aired give the same credit to the rich, who don't need it, as to the poor. Since poor people are most likely to live in old, drafty, poorly-insulated buildings and have less ability to pay, the most effective and equitable program would be one that concentrated benefits among lower-income families. Just as it takes money to make money, it takes money to save money. And the poor, curiously enough, don't have much money.

A related weakness of the overall insulation plan is that it provides little help for renters. Most landlords have no incentive to save energy, since renters are either billed directly by utilities or pay through higher rents for energy costs. The majority of all housing in urban areas is rental and the vast majority of the poor rent; the plan, therefore, will not adequately help the poor.

The utility insulation program outlined in the bill is not the answer. A more direct program of public action is warranted. This would include expanding the current CSA and FEA weatherization projects substantially more than now proposed in the legislation; there should also be increases in Community Employment and Training Act wages to union levels to faciliate insulation installation. In addition, providing direct federal grants or loans with interest rates

graded according to ability to pay, would probably get the job done more quickly, thoroughly, effectively, and fairly.

The central point to be made regarding the proposed enlarged weatherization program and other options discussed above is that there are other and preferred options to achieve wide-spread residential energy conservation. As now proposed, utility insulation projects are mandated and thus the primary option to be used; alternative programs are to be relied upon only as a last resort and subject to provisions that will discourage their development (sec. 104). We propose that the reverse be made the policy adopted by this committee.

That is, utility insulation programs are to be used only as the option of last resort—and then subject to strict controls. The states and/or local communities should be encouraged to develop their own approaches to meeting the federal goal of extensive residential energy conservation. These approaches would seek to tap resources and develop programs to install insulation in residents' homes that are not dependent upon the investor-owned utilities. More specifically, the federal government could embrace the model of state energy plans already in force as a result of the 1975 Energy Policy & Conservation Act; through such plans, the federal government would specify the home insulation goals the states must meet by a certain date but the state governments would choose the actions to meet those goals that are best suited to their individual interests, resources and capabilities.

In those instances where it is deemed that no alternative exists but to rely upon the private utility companies to carry out an insulation program, the following minimum safeguards should be mandated: (1) the utility may not cut off a customer's utility service if the customer fails to maintain payments for the insulation, (2) a utility may not create or own any subsidiary to carry out purchase and installation of insulation materials; such services should be subcontracted out equitably to insulation businesses and contractors in the given community, (3) the insulation program should be operated on a low or no-profit basis for the utilities, (4) the value of the insulation materials purchased should not be included in the utility's rate base, and (5) there should be very close scrutiny of the utility by a state regulatory agency or other body of all facets of the program.

In conclusion, I would like to reiterate several points. We oppose investor-owned utility involvment in residential insulation programs because of the dangers of monopolization, the higher costs that would result to customers, and the inherent conflict of interests that exists. Other options for meeting national goals of residential energy conservation should be used first; these include using municipal utilities, community co-ops, insulation businesses themselves and the Community Action Programs. To aid the last of these, there should be a substantial increase in allocations for the federal weatherization program. Only as a last resort should private utilities be brought into insulation programs—and then, only if subject to strict controls.

I appreciate the opportunity to share our views with you. I'd be happy to answer any questions you may have about my statement.

Senator JOHNSTON. Mr. DeLoss.

STATEMENT OF GARRY DeLOSS, ENERGY POLICY CONSULTANT, WASHINGTON, D.C.

Mr. DELOSS. I want to talk about the need for a mandatory program for energy conservation in existing buildings.

In looking at the Carter energy plan, one of the first things I was struck by was the gap between the rhetoric and the reality of the plan. One of the most obvious places where this exists is in the area of energy conservation. The plan very clearly lays out the merits of conservation. It explains how investing money in saving energy is just as good as investing money in producing energy, in fact it is better when you can find lower cost, so-called conservation energy.

Yet they don't have a conservation program that lives up to the claim that conservation is the cornerstone of their energy plan. We

can see this in existing buildings, for example. Here you have a fantastic inventory of existing buildings, 70 million or more residential units alone. You have in those buildings a lot of energy waste going on. There is a great potential for saving energy there in cost effective ways.

That amounts to an energy resource base. You could call it your conservation energy resource base. It is one of our least speculative, lowest cost energy sources in our country right now. When you find that kind of resource base lying around, you should create a crash program to exploit that resource base.

Voluntary programs are not adequate to do that. We won't have the massive exploitation of conservation resource base we need with purely voluntary programs. I am very much in support of a concept that has been endorsed by the Energy and Power Subcommittee of the House Commerce Committee recently where they have amended the President's plan to require the development of minimum energy efficiency standards for existing buildings at the point of sale after January 1, 1982.

If you do not have this kind of minimum standards program, what we are going to have is individuals who will be retrofitting their homes and office buildings with widely varying standards. We will have to turn around and do this 10 or 15 years from now, go back and retrofit those buildings a second time when we realize we made a mistake by not doing it right the first time.

Another problem if we don't do this, if we don't maximize the near-term conservation potential we could have and, therefore, we won't displace as many oil imports, we won't displace as many powerplants and so forth as we could have with more cost-effective investments in conservation.

From the perspective of consumers, and I spent 5 years working in the Nader organization trying to represent consumer interests in general, I think a mandatory program would be better than a voluntary program for a number of reasons. I will recite two of them.

Senator JOHNSTON. Mandatory as to whom?

Mr. DELOSS. What the House has done is to make it mandatory at point of sale. As I will explain in a second, what that really means is the buyer ends up paying for the retrofit measures. Let us say in 1983, I go out to look at two houses. They are on adjacent lots. One is 10 or 15 years old; one was just built. Under this program, there are mandatory standards for the new house built in the 1980's and mandatory standards for the existing house at point of sale.

I would be looking at two houses both of which cost a little extra because they both are energy efficient. If I don't have mandatory standards for that older house, I might be able to buy the house for less, but the house is going to be an energy-wasting house. From a consumer point of view I am not hurt by a mandatory standards program. On the other hand, from an owner-occupant point of view, since this requirement only occurs at the point of sale, you don't have the objection we have run into in the past where people recoil at the thought of a mandatory program.

They think a Government agent or somebody in uniform is going to be coming around and invading their house to determine if it is energy efficient or not and to require them to install insulation and other energy saving devices. I think requiring the retrofit measures at

point of sale is attractive both from the point of view of the owner-occupant and the person who is purchasing the house.

Another consumer interest served here is nationally we are all better off if we exploit lower cost energy resources than before we start investing in higher cost energy resources. We can get energy from investments in insulation and other measures at the cost of $5 to $6 a barrel of oil equivalency, so therefore, the consuming interest would be better served by a policy that directs investment into that lower cost energy before we continue to pay for the $14 or $15 per barrel energy.

Basically, I think the ideal program would be to take all of these Federal incentive programs people are talking about, what we might characterize as carrots and combine them with a stick, the mandatory retrofit standards. I notice on the House aide, for example, so far we have three committees with three different programs over there.

They ought to be viewed as complementary, not mutually exclusive. The Ways and Means Committee has tax incentives; the Banking Committee's Housing Subcommittee has the weatherization program and the loan program. This smorgasbord of carrots should be combined with the Energy and Power Subcommittee's stick of mandatory retrofit standard in probably the ideal package. If people feel burdened by the mandatory retrofit standard, they have some relief in the incentives program.

This proposal has come before the California Legislature for 4 years in a row, and it has been defeated every time because the real estate lobby objects to it. You can anticipate a great deal of opposition. I think the program has a great deal of merit. I do not see how the Carter plan can possibly talk about 90-percent retrofit of buildings by 1985 without talking about a mandatory program like this.

Senator JOHNSTON. Let me cut you off at that point, if I may. We have run out of time.

I just want to throw out this general question. It seems to me perfectly obvious we need a certifying agency to certify contractors; to certify kinds of work. Mr. Fawcett was talking about this earlier; oil burners, replacing that machinery.

I don't think the Federal Government is capable of coming out anytime soon at least with a list of eligible equipment. You have to have a certifying agency with some discretion to go in and say what is eligible, for what I believe we ought to have is guaranteed loans rather than tax credits.

I agree with your statement. Tax credits just help the rich. I think you have to be pretty sophisticated for it to be much of an incentive. What we want to do here is extend credit, not some tax credit, what I mean is to get the dollars.

If I am correct, we need a certifying agency, but it seems to me the Federal Housing Administration ought to be the one to do it rather than local government. The reason I say that is first I think they have more expertise. Second, we would be dealing with Federal dollars. We should not have a State housing inspector certifying something with Federal dollars. Would you comment on that?

Mr. WHITE. I really have not given it any thought, but on the face of it, it is obvious somebody is going to have to do it. I believe if you look around the whole panoply of Government agencies, the FHA is probably the best. They already have to enforce some standards in deciding whether to approve some loans.

They have had a standard of 1½-inch ceiling insulation for 30 years. I think they do have the ready ability. The problem is: I guess, the last 10 years or so have demonstrated what seems so simple in the hearing room here in Washington about how something can be done, falls apart when it gets down to where the people are.

Senator JOHNSTON. The FHA is the owner of the first house I bought. I appreciated the fact they required all of these things to be done, I did not have any idea what they were, but I was glad they put an inch and a half or whatever it was in the ceiling, the slab was so thick and so forth.

Mr. BOSSONG. I think some of the States could undertake it faster. You might look at what is being done. A number of States are working to set standards for solar units which is something the Federal Government is also seeking to do. However, several States have beaten the Federal Government to the punch; Florida, Illinois, New Mexico, have set standards.

I would say use FHA but give the States the option if they can do a better job, a faster job to do it themselves.

Senator JOHNSTON. I agree with you. Some States do a great job, but the idea is we have to set a national standard. How do you evaluate the States? Do you just provide for some input from the States to the FHA for standards?

If my idea were put into law, this agency that does the certifying would be certifying for Government loans. You would not want to have a State agency certify the Federal loan; would you?

Mr. BOSSONG. Perhaps a solution would be to have the State standard accepted if they exist first and eventually replace them with a uniform Federal standard.

Senator WEICKER. I would like to compliment each of you for your statements. I think Mr. White's statement especially hits the problem right on the nose. I would hope we would maintain a focus on the types of alternatives you mentioned in your statement. It must be clear to everybody since the principal focus of legislation is in the Finance Committee and the House Ways and Means Committee, that the whole principal thrust of this program is via the tax program.

As has been indicated in one of the statements here, there are no alternatives to give relief to the poor, to the less well off in this country. If there was an alternative or an accompanying statement of, let's say, energy stamps or an accompanying statement as to how these rebates are going to affect people, that would be something else.

But in the meantime there doesn't seem to be any form of mandatory conservation that is going to impact on everyone. My concern is already the groups of people you are concerned with, our less fortunate citizens, have been conserving. They have been forced to conserve by virtue of the price mechanisms over the past several years. I don't know how to get that message across.

I would like to have more in the way of discussion on this point of mandatory conservation, ban gas-guzzling cars, increased subsidies for city transportation, express bus lanes, bicycle lanes; how do we get the message across to the public to have the Congress act in this type of direction? It is not coming across.

Mr. WHITE. It is very difficult. Part of the answer, or part of the explanation, is that President Carter insisted on that part of the program being in there, April 20, and some of it, frankly, was not fully

thought through. One essential element, for example, is the strengthening of public transportation. It is hard to tell people to get out of their automobiles unless you have some other place to put them.

Everybody I know believes public transportation is a very good idea but until Congress has a specific program and has begun to act on it—it isn't that we aren't doing anything; it is just not that we have just discovered public transportation; there is an urban mass transit administration. There are some able people and there are some excellent programs done experimentally right here in the Washington area with special bus lanes for express buses and carpooling.

But how, if you will, do you galvanize the country? President Carter has tried to do that more than anyone else before him but it is a tough job. I don't know the answer to the question. There is a highly increased sensitivity around the country for energy because those darn utility bills are up. They have increased awareness, but it is harder to know what the great American public believes.

The pollsters work all of the time and indicate responses to questions and there is much more willingness to do things. How to go beyond that is frankly something I do not think I can give you any guidance on.

Senator WEICKER. I hope everyone will read Mr. White's statement. It is an extraordinarily good statement. It has what illusory aspects as to what is being proposed here. I compliment the President, I am not nitpicking, I am all for his focusing on the problem, but we have to go beyond that. I have a fear here of what is being proposed in the sense of conservation and production is very illusory.

Senator Metzenbaum and myself commented yesterday, the impact or the substance rather is not there. The form has been great but the substance is what we are concerned about. I am not at all hesitant to stand up there and plump for mandatory conservation. Let's use that word which no politician wants to use: rationing.

Rationing not by price, but rationing where the impact falls on everybody's shoulders and the better off you are, the more impact that falls on your shoulders, not the way we have it turned around right now where the poorer you are the greater the burden. I just don't see, if we are going to do the job and do it correctly, how we will get around that.

I know I will find some disagreement from my colleagues on the other side of the coin: decontrol. Private enterprise needs the capital to produce more of these things but if only we had suffered some of these inconveniences 4 years ago, I think we might be seeing the light of day today, but somebody has to come forth with the message today.

There is going to be a disagreeable period of time, there is no getting around it. If we are willing to experience that, at least we don't have to continue.

You mentioned a minute ago those utility bills. I should think the public has got to understand one thing now, for 4 years the politicians have been telling them no mandatory conservation can do it; 4 years the politicians have been saying controls and everything is going to be all right; for 4 years we have accepted both of those policies and yet for 4 years prices have continued to go up and shortages have continued.

Senator METZENBAUM. I would like to associate myself with the comments of the distinguished Senator from Connecticut who has zeroed in on the problem, as has the administration. I think some of your answers are far more effective than the administration's program. I would like to ask you to help Congress in this respect; it is not enough to say we need to do something else, we have to prove our case.

I think it would be helpful if you took some of the President's proposals and the amount of savings the administration has indicated by raising natural gas prices to $1.75, there will be no savings, net, yet there are other proposals that would effectively save natural gas.

There is a $15 billion wellhead tax which would have two one-hundreths of 1 percent, or 25,000 barrels a day, according to Alice Rivlin of the Congressional Budget Office. Compare that with the ban on gas-guzzling cars and other proposals that have been made, but I think it is imperative we talk about alternatives and talk about barrels per day, that seems to be the language of the times.

If you could do that promptly, I, for one, and other Members of the Senate do have the strong feeling we ought to produce some alternatives rather than just say we don't like this or we don't like that. Would you be willing to prepare such a list?

[The list was not received for inclusion in the record.]

Mr. WHITE. It is flattering to be asked and the answer is, yes. But so there will be no misunderstanding, you cannot imagine how thin our operation is in finances and resources, but we do have the ability to call on some of our constituent groups and we will do the best we can. I had an enormous amount of assistance in the preparation of this statement from one fellow who is himself a dynamo, Ed Rothschild who previously worked up here on the Hill. Maybe we can turn Ed loose on it for half a day. He will come up with a better program than the administration did in 4 months.

Senator METZENBAUM. We are very interested in preparing a viable alternative to at least some of the programs.

Mr. DeLoss, you have made some suggestions and I would hope you would help this committee in a similar manner indicating what could be accomplished.

Mr. DELOSS. It is difficult sometimes to quantify and give you the exact numbers you were talking about a minute ago with Lee. But we can say, generally speaking, that the conventional wisdom is right now that the greatest opportunity for energy savings at the lowest cost is in existing buildings.

It seems to me when you put those two things together, that would lead you to see a need for policy to somehow get in there and maximize the exploitation of what I would call a conservation energy resource base and this program does not do that.

Senator METZENBAUM. I agree. Time does not permit further elaboration on the subject, but our staff would be happy to explore the subject further.

Mr. DELOSS. To give you some idea of how much energy conservation you could get in existing buildings, this committee 2 years ago heard testimony from an architect from New York City by the name of Carl Stein to the effect that a cost-effective conservation program in existing buildings in this country could save as much energy as 600 1,000-megawatt powerplants could produce. That is an approximation

of the energy you could produce through conservation in existing buildings.

I think he broke that down to saying that it meant it was the equivalent of having a new powerplant come onboard every 2 weeks for the next 25 years. It is an energy reserve we ought to be exploiting.

Senator METZENBAUM. We would like to get from those of you who are witnesses this morning some concrete ideas for mandatory conservation. We need to know what the savings would be, but not in abstract terms, not just say this will save a lot, but indicate we must make comparisons with the administration's programs. We need some delineation as to what those actual figures will be, not just in the abstract. We would appreciate hearing from you and our staff will be in touch with you.

Mr. Bossong, I would like to ask you one question. In response to my question, you indicated you are opposed to mandatory requirements, to convert, to insulate. When I heard your statement I thought you said you were opposed to mandatory conversion if it is totally in the hands of the utility. Which is your position? Are you opposed to mandatory conversion for insulating purposes? Or are you opposed to the utilities having control of insulating programs?

Mr. BOSSONG. We strongly support mandatory insulation programs. We oppose mandatory private utility involvement in the program however.

Senator METZENBAUM. Thank you. I appreciate that clarification.

Mr. WHITE. Mr. Chairman, Senator Metzenbaum asked us to do something and we will. May I suggest this subcommittee do something; that would be a letter from the chairman to the administration asking where is that program, promised over 60 days ago, to handle special problems of poor people?

Senator JOHNSTON. Insulation?

Mr. WHITE. No; in general. They know there is going to be an impact on people at the bottom of the economic scale. They said we are working on this, it will be sent to Congress shortly.

Senator JOHNSTON. A rebate plan you are talking about?

Mr. WHITE. No; it is a program of special assistance to people who are economically hurt the hardest. For example, there is a question of energy plans. The Congress already appropriated $200 million to assist the worst hurt people in the last winter who could not pay their utility and fuel bills. Incidentally, the administration was opposed to that bill. It seems to me somebody such as this committee ought to prod the administration on that piece of the program. I have a hunch it may never get here unless there is some pressure.

Senator METZENBAUM. May I suggest Mr. White talk with our staff and see exactly how the administration has addressed this matter and give us a rough draft of your idea and see if we could not get such a letter off. I don't specifically recollect the language. I think we ought to tie that together and my guess is you are familiar with it.

Senator JOHNSTON. Thank you very much. I am sorry we did not have more time. I might say as this panel is leaving, on the question of savings in existing buildings, I think there is a whole field out there for architects to recommend. I think they are just beginning to get the expertise, but there is as much to save in existing buildings, not only by retrofit but by the way they manage their energy.

Mr. DeLoss. I have cited examples in testimony before the committee this spring. I might make one last comment. ASHRAE—the American Society of Heating, Refrigeration, and Air-Conditioning Engineers—is now developing a standard for retrofitting commercial buildings. There is a lot of thought going into this right now.

Senator Johnston. Senator Culver.

STATEMENT OF HON. JOHN CULVER, A U.S. SENATOR FROM THE STATE OF IOWA

Senator Culver. Mr. Chairman, I appreciate this opportunity to introduce an executive from Amana Refrigeration to the Senate Subcommittee on Energy Conservation and Regulation. Clearly, today's hearings on mandatory appliance efficiency standards are crucial to any overall Federal energy policy and I am confident that the Amana Co. has much wisdom to share on this issue.

Standards are crucial to any overall policy on energy. As the subcommittee members are perhaps aware, Amana Refrigeration has earned a reputation for building high-quality, high-performance appliances. Amana is one of the recognized leaders in the industry for designing energy efficient appliances, and in fact, came out with a significant improvement in refrigeration efficiency in 1973, just months before the oil embargo.

The gentleman representing Amana today is the vice president for planning, Mr. Dan R. McConnell. Mr. McConnell, an engineer by training, has been with Amana for some 17 years. He has served on the U.S. Surgeon General's task force on microwave ovens and is U.S. Chairman of the International Standards Committee on microwave ovens.

As vice president, he bears responsibility for new product planning and development and has worked closely with the Federal Energy Administration and the California Energy Commission.

It is worth special note that Amana has accepted in a positive way the challenge of appliance efficiency standards.

To share this perspective with you, may I introduce Mr. Dan McConnell.

Senator Johnston. Thank you Senator Culver. Mr. McConnell, I will have to limit your testimony to 3 minutes. Just give me the central point.

STATEMENT OF DAN R. McCONNELL, VICE PRESIDENT, PLANNING, AMANA REFRIGERATION, INC.

Mr. McConnell. We would like to make reference to the minimum efficiency standards enacted by the State of California. The standards which apply to refrigerators, freezers, room air-conditioners, and central air-conditioners, can be met although with some difficulty.

When the standards go into effect in November of this year we expect to meet the California standards. When our industry filed suit against the State of California—subsequently we resigned from our industry association over this issue.

We believe that any Federal standards that are enacted should be essentially as ambitious as those imposed by the State of California.

When the goal of significant reduction of energy consumption is realized, only then will the issue of preemption of State standards be settled effectively. We believe the California standards can be met and, if a reasonable time period is granted to manufacturers, similar Federal standards can be met without any serious economic disruption, without any life-cycle cost increase to consumers and without any loss of jobs.

Senator JOHNSON. Let me say, by the way, I have read your statement. You are for Federal standards tougher than California, but for preemption?

Mr. MCDONNELL. Yes; we are certainly in favor of a uniform Federal standard, but we think a mild Federal standard is not the answer.

Senator JOHNSTON. I understand that you are for tough Federal standards, but you would be against preemption, letting the States set their own standard tougher than the tough Federal standards.

[The prepared statement of Mr. McConnell follows:]

STATEMENT OF DAN R. MCCONNELL, VICE PRESIDENT, PLANNING, AMANA REFRIGERATION, INC.

My name is Dan McConnell and I am Vice President, Planning of Amana Refrigeration, Inc. We are delighted to have an opportunity to express our views on the appliance efficiency provisions of S. 1469, which we consider to be one of the most important pieces of legislation facing this Congress or any Congress in view of the energy crisis confronting our nation. Before outlining our position for the Subcommittee on this bill, we would like to very briefly identify our company and the products it manufactures.

Amana Refrigeration, Inc. was founded in 1934 and is a manufacturer of quality appliances for the home. In our Amana, Iowa plant we manufacture refrigerator-freezers, chest and upright freezers, and Radarange® microwave ovens. In our Fayetteville, Tennessee plant we manufacture room air conditioners, central air conditioners, central heating equipment, compactors, dehumidifiers, and microwave ovens. Late this summer we will begin manufacture of electric ranges, in a new facility in Fayetteville, Tennessee.

It is our understanding that S. 1469 would amend the Energy Policy and Conservation Act so as to authorize the Federal Energy Administration to promulgate mandatory federal energy conservation standards for appliances. Amana supports this concept as embodied in this proposal and hopes that this Subcommittee will approve Part B Subpart 1. Only through the promulgation of federal mandatory standards would the appliance industry be able to manufacture its products uniformly for sale throughout the United States without the fear of varying state standards. Also only with federal mandatory standards will the consumers be able to purchase energy efficient appliances throughout the country irrespective of where the consumer lives. Such a mandatory approach by the federal government will be beneficial to both appliance manufacturers as well as consumers and will certainly result in energy efficiencies which is the main purpose of this legislation.

As a part of our basic belief in building a quality product, we have emphasized good design, construction, and quality control in order to offer better performance and reliability. For many years, we have promoted the benefits of better design, including lower electrical or gas consumption resulting in lower operating cost even though the initial purchase price was somewhat higher. In other words, we are quite familiar with the principle of promoting more efficient appliances, even when the cost of energy was relatively low.

For example, we have manufactured and sold electric heat pumps since 1956. We began development of central heat pumps in 1954. Although heat pumps offered dramatic reductions in electricity consumption over electric resistant heating systems, the high initial cost of heat pumps and certain early reliability problems inhibited the growth of the heat pump market. By the early 1970's even with major improvements in reliability there were only five (5) remaining manufacturers. During this period Amana persisted in promoting the efficiency

advantages of heat pumps. Today, of course, the increased cost of electricity has created a boom market for this product, and deservedly so.

In addition, since 1958 Amana has manufactured a line of window type air conditioner-heat pumps, a product manufactured by relatively few companies that offers genuine efficiency advantages especially in moderate climates.

Another energy saving product emphasized by Amana is the combination electric cooling-gas heating system for the home with the Heat Transfer Module ("HTM®"). This device has been called "the first major breakthrough in heating technology in years". The HTM® is an advanced type of burner/heat exchanger, the basic technology of which was derived from aerospace research. On the basis of independent laboratory tests, gas fuel consumption can be reduced from 22 percent to 26 percent for various northern cities as compared to a conventional gas furnace. Amana began development of the HTM® system in 1966. After several seasons of field testing, we moved to full-scale marketing of HTM® systems in 1971. A recent improvement in these systems has raised the EER of the cooling side of these systems up to 8.9.

The HTM system incorporates direct spark ignition, thereby eliminating standing pilot lights. In addition we have manufactured a line of conventional gas furnaces with direct spark ignition since late 1975. The elimination of the pilot light significantly reduces the annual consumption of gas.

In refrigerator-freezers, Amana introduced energy saver controls into the market in 1965. These controls, currently the subject of heavy market promotion, permit the user to switch off antisweat heaters when they are not necessary to prevent condensation. In most climates, and for most of the year, humidity conditions are not great enough to require that these heaters be energized, hence the logic, pioneered by Amana, that a control be provided to switch them off when they are not needed.

Also, in 1965 Amana introduced a new line of Deepfreeze® Chest Food Freezers wtih polyurethane foam insulation. These chest freezers were so well insulated, that the entire Amana line will meet the new California minimum efficiency standards without change.

In 1973, Amana began work on a radically new refrigerator-freezer design that incorporated all of the latest technology in refrigeration such as thick wall polyurethane foam liners, radiant shell condensers and low wattage fan motors. This design was virtually identical to that proposed in a study published by the Massachusetts Institute of Technology in 1974. The Amana design concept was presented in a technical paper before an ERDA sponsored conference in May 1976. The new design was put into full scale production in August 1974.

In late 1974, Amana began development work on a further refinement of this concept and a massive retooling of refrigerator-freezers, and upright freezer production lines. This activity has led to the introduction in January 1977 of our new "2 plus 2½" line of refrigerator-freezers and freezers. These models in a wide selection of capacities incorporate 2 inches of foam insulation around the refrigerator section and 2½ inches around the zero degree freezer where it is needed the most. All of these models represent a major reduction in electricity consumption over conventional refrigerators.

Similarly, we have undertaken wide-scale development programs in central air conditioning and room air conditioning products to produce air conditioners with EER's from 7.7 to 10.1, all of which are considered to be in the high efficiency category.

In microwave ovens, which are an inherently efficient cooking product, Amana has shown the highest efficiencies of any brand tested in independent laboratory tests. Amana also undertook a large scale study of the comparative efficiency between microwave ovens and conventional electric ranges in 1973. The technical report describing this study was chosen as the best microwave paper of 1974 by the International Microwave Power Institute.

In briefly describing our overall corporate program for the design of more efficient appliances, we do not mean to imply that the task is not difficult. To incorporate all of the latest technology in appliance efficiency, while creating a product that fulfills the needs of the consumer, and to do so for a reasonable cost, is a formidable task indeed. It is being acomplished at Amana primarily because we started with basically efficient designs many years ago, and because we have pursued a comprehensive plan to improve all of our product efficiencies for the past five years. We still have a great deal of work ahead of us and we are pursuing it diligently.

The investment is very great. The new "2 plus 2½" line of refrigerator-freezers alone required an investment in excess of 9.5 million dollars. And Amana is not the largest manufacturer of refrigerators and freezers.

Prior to addressing the subject of federal minimum efficiency regulations for appliances, we would like to make reference to the minimum efficiency standards recently enacted by the State of California. These standards, which apply to refrigerator-freezers, freezers, room air conditioners, and central air conditioners—can be met, although not without some difficulty, when the standards go into effect in November 1977. We expect to meet the California standards with few exceptions. When our industry filed suit against the State of California to overturn these standards, we chose not to participate. Subsequently we resigned from our industry association over this issue.

We believe that any federal standards that are enacted should be essentially as ambitious as those imposed by the State of California. Only then will the goal of a significant reduction in energy consumption be realized. Only then will the issue of preemption of state standards be settled effectively. Or as we have mentioned, the California standards can be met—and, if a reasonable time period is granted to manufacturers similar federal standards could be met without any serious economic disruption, without any life-cycle cost increase to consumers, and without any loss of jobs.

As more states pass tough minimum efficiency standards in the next year, which is a virtual certainty, the need for equally tough federal standards becomes even stronger. Recently, the states of Wisconsin and Minnesota have passed a minimum efficiency requirement for air-conditioners that are patterned after the California standards. And others are in process.

Amana favors tough mandatory federal efficiency standards for appliances, as long as the standards are based on performance criteria that are feasible to attain.

Amana encourages continuing progress in the current FEA program to issue test procedures based upon current industry test methods. These test procedures provide a uniform method by which engineers may evaluate the efficiency of an appliance, and they provide a sound data base on which progressive improvement can be measured. We must have uniform federal test procedures and we need them as soon as possible.

Amana respectfully suggests some reconsideration of the format on appliance efficiency labels as set forth in § 324 of the Energy Policy and Conservation Act. § 324 delegates to the Federal Trade Commission the authority to prescribe labeling rules. § 324(c)(1)(B) requires that the rule must require the label to disclose "information representing the range of estimated annual operating costs for covered products . . .". Amana requests that Congress amend the Energy Policy and Conservation Act so as to delete § 324(c)(1)(B) so that the requirement to state the range of cost will be removed. The reason that Amana suggests that deletion of the range requirement is that we would opt to begin labeling our appliances as soon as the labeling format were finalized by the Federal Trade Commission, thus implementing the Act as early as possible. But we can not do so. Under the current method we must wait for all of the industry figures to be filed and authenticated so that the official range of values can be established for each appliance category, before we could proceed. In addition, every time a manufacturer of the worst or best model in a category, makes a design change, the label will be incorrect and obsolete. This concept appears unnecessarily complex and counterproductive. The label could be simplified by requiring that a manufacturer show his own consumption figures on the label and not the industry range.

Even though Amana opposes the label which contains the range of estimated annual operating costs, Amana does support the cost of operation concept as a basis for energy efficiency labeling for most products. Cost of operation gives the consumer a means of calculating the "payback" on any initially higher cost that might be paid for a more efficient appliance. However, there are many products that would benefit by additing another measure, such as EER or kilowatt hours, to the label to avoid misleading the consumer since to show only the cost of operation in the face of widely varying utility rates could lead to overstating or understating cost of operation by several times. Therefore, we would urge that both cost of operation and a measure of consumption be stated on a label.

Amana favors the minimum efficiency proposal. It provides a simple clear-cut target toward which the design engineers can work. It is administratively

simple, dispensing with the necessity for filing sales figures, a matter of some controversy due to the sensitive nature of such company figures. Furthermore, a minimum standard is inherently fair since it provides the same objective to all parties. And finally, the federal minimum standard promises uniform national criteria which permits an orderly program of product development and efficient investment of equipment and facilities. The only requirement, to assure the accomplishment of the effective conservation of energy, is that minimum efficiency standards be based upon attainable technologies reasonably applied.

The task of improving appliance efficiencies is not as simple as some would maintain. Sound engineering principles must be applied so that the resulting product is reliable and performs satisfactorily for the consumer. And the end product must be reasonably priced.

In addition, there are some important components that affect appliance efficiency that are not always under the direct control of the appliance manufacturer. In these areas, we can only attempt to convince suppliers that efficiency improvement should be made in the products that they supply to us. For example, Amana does not manufacture motors, that is, fan motors, evaporator motors and the like that are used in nearly every appliance. By working with one motor manufacturer over several years, we were able to reduce the consumption of an evaporator fan motor from 54 watts to only 12 watts. We need cooperation and investment from compressor manufacturers and motor manufacturers, and we need technological improvement in insulation and refrigerants. Any breakthrough in these universally used products would have enormous leverage in reducing energy consumption by the entire industry.

Our country's need for conservation of energy is clear. And a federal minimum efficiency standard for appliances is a straightforward step in its accomplishment. Amana Refrigeration, Inc. is in favor of this program.

Senator JOHNSTON. Mr. Baumgart is next.

STATEMENT OF GUENTHER BAUMGART, PRESIDENT, ASSOCIATION OF HOME APPLIANCE MANUFACTURERS

Mr. BAUMGART. I am Guenther Baumgart, our industry would like to make one thing eminently clear at the outset and that is our intent to do the best we can in the interest of consumers and conserving energy because we feel that serves our interest too.

I will eliminate all the parts of my statement except one, if I may. I have a statement that is on file with appendixes and so forth. We have previously supported the target form of energy conservation. However, in the recent hearings, we have changed the position to support the minimums for the primary reason of getting the accompanying preemption action by the Federal Government. Without preemption, we have economic confusion of the highest sort.

As written, S. 1469, does not contain any amendments to section 327 of the existing Energy Policy and Conservation Act.

Senator JOHNSTON. You are for Federal standards with preemption?

Mr. BAUMGART. Federal standards with strong preemption with the States having to demonstrate that they need an exception from the preemption clause—demonstrated (1) on the basis of this compelling State need and (2) will not interfere with interstate commerce.

Senator JOHNSTON. Preemption unless they can make that showing.

Mr. BAUMGART. Unless they can make a strong showing there is a definite need and it will not unduly burden interstate commerce. We favor also that energy efficiency standards be economically sound and technically feasible, that they be reasonably accomplishable as to timing, that suitable classifications and subclassifications of appliance

categories be included, that identical classifications be used for energy standards and for FTC labeling and that consumer options and other innovative energy saving devices be recognized.

We feel sections 323(c) of the Energy Act should be amended to give appliances a longer time to convert their advertising and other representations concerning energy consumption, as each FEA test procedure is issued.

Finally, we have noted section 325(a) eliminates the requirement of the present law that the National Bureau of Standards participate in the regulatory process. We strongly urge NBS be given continued authority and responsibility because of the accumulated experience and expertise and knowledge of that agency.

We have supplied amendments, wording for this as well. We thank you for giving us a chance to talk. We wish we had more than 3 minutes.

[The prepared statement of Mr. Baumgart follows:]

STATEMENT OF GUENTHER BAUMGART, PRESIDENT, ASSOCIATION OF HOME APPLIANCE MANUFACTURERS

My name is Guenther Baumgart, I am President of the Association of Home Appliance Manufacturers (AHAM) whose members manufacture nearly all of the major and portable appliances produced in the United States. Of those appliances, refrigerators, refrigerator-freezers, freezers, dishwashers, clothes dryers, room air conditioners, kitchen ranges and ovens, clothes washers, humidifiers and dehumidifiers are specifically included in Part B of the Energy Policy and Conservation Act, which is the subject of these hearings. Lists of the companies belong to AHAM and the products included in its scope are attached as Appendixes 1 and 2.

HISTORY OF APPLIANCE ENERGY CONSERVATION EFFORTS

This Senate Subcommittee on Energy Conservation and Regulation is now considering the third generation of government-industry appliance energy conservation programs.

The first program was the "Voluntary Energy Labeling Program," initiated at the request of the President by the National Bureau of Standards in late 1973.

Included were room air conditioners, the white goods kitchen appliances, home laundry and televisions.

The industry cooperated with this effort.

Standards for measure based on AHAM and other industry standards were being worked out in conference between: (1) AHAM liaison committees for each product, and (2) the corresponding National Bureau of Standards executive. Label formats and specifications were being developed in a similar fashion.

Improvement targets were in the process of being proposed—more for some lines, less for others, so that the net would be the 20% energy use improvement goal to be reached by 1980.

I personally feel this program would have worked.

Nevertheless, in late November and December of 1975, in joint House and Senaet Committee mark-up sessions, Congress added a Part B, "Energy Conservation Program for Consumer Products Other Than Automobiles," to the Energy Policy and Conservation Act of 1975.

Apparently Congress did not share our confidence that the Bureau of Standards program would work and concluded that the force of specific legislation should be applied.

Nevertheless, when EPCA became the law of the land the appliance industry set out to comply.

This law replaced the voluntary program with a mandatory one and assigned the administrative responsibility for the conservation regulations to the Federal Energy Administration and the administrative responsibility for labeling to the Federal Trade Commission.

The basis for improvement was changed from lessening the energy input (the NBS program) to improving the energy efficiency of products by a specified amount by 1980. The basis for labeling was shifted to emphasis on the average annual cost of operation. A time schedule was set up to have improvement targets issued, followed later by test procedures to be designated by FEA and then labeling required by FTC. Most of the deadlines were set for 1976 to give time for industry design, tooling, production and distribution efforts. It should be noted that normally a changeover of this magnitude takes industry three years because of all the steps involved. Thus timing was very important.

The FEA has, we understand, advised Congress that final test procedures and energy efficiency targets for all AHAM products will be published by December of this year. The FTC, in turn, would be expected to complete its labeling regulations sometime in 1978.

S. 1469, currently before you, is a third generation program in this area and, like its predecessors, it strikes out in a new direction that requires a recasting of industry planning and investment.

S. 1469 would require the FEA to set mandatory minimum levels of energy efficiency performance for refrigerators, refrigerator-freezers, freezers, water heaters, room air conditioners, kitchen ranges and ovens, central air conditioners, and furnaces and provide the discretionary authority to set similar minimum standards for the following less energy intensive products: dishwashers, clothes washers, home heating equipment, television sets, clothes dryers, humidifiers and dehumidifiers.

The bill also amends Part B of the Energy Policy and Conservation Act with regard to the threshold finding for including additional appliances in the regulatory scheme and the administrative procedures for setting efficiency standards.

Throughout these evolutions the appliance industry position has been consistent:

1. It has recognized our responsibility to assist in a national energy conservation effort. Even before the NBS voluntary program the industry in 1973 had initiated its own voluntary energy conservation program consisting of certification of room air conditioner efficiency ratings, consumer education pamphlets and, later, energy consumption certification of refrigeration products.

2. It has preferred programs that provide the greatest flexibility to manufacturers in improving the energy efficiency of products. For this reason, energy efficiency improvement targets have been preferred over minimum standards.

3. It has advocated a single, Federal appliance energy program in preference to fragmented state and municipal regulations which disrupt the economies inherent in mass production and distribution.

4. It has urged a program that mandates appliance industry energy conservation proportional to its actual energy consumption. The AHAM products specifically referenced in S. 1469 represent an estimated 2.7% of the nation's annual energy consumption. On the other had these products represent an $11 billion industry at retail and an estimated 160,000 manufacturing jobs. Severe disruption of the industry should be avoided.

DILEMMAS POSED BY S. 1469

Consequently, S. 1469 presents four dilemmas for the industry which affect our position on the legislation.

The first dilemma is the time loss caused by programming, reprogramming, and re-reprogramming the appliance energy conservation effort.

In the weighted averaging requirements of the existing law, manufacturers are able to work on improving the whole line of any product group and, in the averaging process, get credit for their efforts. More insulation in one spot, more copper tubing in another, or an energy saving option switch in another would all help and genuinely conserve energy.

In the minimum acceptable efficiency requirements of President Carter's proposal, the industry effort would have to be concentrated on the designs which did not meet the minimum. This, too, would conserve energy, but it would require that a completely different set of changes be developed by the manufacturers.

Until the introduction of S. 1469 and H.R. 6831, the industry favored the averaging requirement:

1. Because it permitted greater freedom of choice to the manufacturer;

2. Because the minimum acceptable standard requirements would tend to eliminate the smaller, less expensive models, thus penalizing the economically less fortunate consumers more than the more affluent ones; and

3. Because the impact would thus fall more heavily on the manufacturers who specialize in the lower end of the market.

The minimums would, of course, be much easier to administer by the government, and would be more definitively certain in the marketing of products to consumers—which is a major consideration for some AHAM members, also.

In any event, because of the dilemma which I will describe next, the industry has reversed its position and will support the President's proposal for minimum efficiency standards on some products if a way can be found to resolve the companion problem which is even greater. (Obviously, if we could have solutions to both, that would be preferred even more.)

The second dilemma is the development of state laws and regulations mandating minimum efficiency standards and design requirements for appliances sold in the several states. Such regulations are never identical with the Federal requirements. Occasionally, they are in direct conflict.

California has a law in place and regulations under it which would prohibit the sale of a large percentage of room air conditioners and refrigerator-freezers listed in the AHAM certification directories.

Wisconsin has a different prohibition type law before its legislature.

New York State would ban all refrigerators which do not have an anti-sweat switch. New York City requires the cost of room air conditioner operation to be posted, with the number of hours of operation higher than that experienced by some two-thirds of the people.

In all, over 25 different state and local energy efficiency regulations have passed, or are being considered. Some states even have intra-state conflicts. The State of California has already passed room air conditioning regulations but the City of Sacramento, the state capitol, is considering higher ones.

If each state has to be treated separately by appliance manufacturers, it will mean that products, labels, and even printing on the outside of cartons will have to be individually made. The economic advantages of large volume manufacturing and of uniform national marketing will be lost and the consumer will be the loser.

The industry's position of supporting the President's proposal for Federal minimum standards is strongly based on having it carry with it a strong, clean-cut, readily administerable preemption by Federal law of all overlapping state and local energy conservation and all state and local energy labeling laws.

If any of the states have a unique reason to have separate and different laws, the burden should be on that state to demonstrate that there is such a need, that it is significantly different than the nation as a whole, and that its proposal would not interfere with interstate commerce.

The third dilemma is the one which stems from what, for want of a better name, is called trade-offs.

Wisely, the Congress tied its conservation of appliance energy legislation to the specification that the regulations spelled out by the administrative agencies be "economically sound and technically feasible."

These disciplines fall, and fall inexorably, on manufacturers, whether or not the law imposes them.

For every improvement there is a trade-off or a cost. If the output of a room air conditioner is increased, it is most likely to be done by adding material—tubing, fins, larger compressor. This increases the size; it reduces the number of windows the unit can be mounted in; and it adds to the cost. It requires more energy to make even if it requires less energy to operate.

Similarly, if the insulation in a refrigerator is increased it must either be larger outside or smaller inside—or use a different kind of insulation.

The state of the technological art is different for each product. Breakthroughs which mean great progress in short time occur rarely—microwave ovens may be a fortunate exception to this.

The industry's position, therefore, is to recommend amendments to S. 1469 which would provide full consideration of industry views in the development of standards and minimums and would require the participation of the Federal government's most technically competent agency—the National Bureau of Standards.

The fourth and final dilemma is the problem of determining in advance what the consumer is going to do and shaping good governmental and private sector decisions accordingly.

The purchase behavior patterns are important because it is very easy to discourage new purchases even if products are more energy efficient. If the cost is

increased too rapidly, if the usefulness is reduced too much, then the consumer may well revert to repairing old appliances even if they are less efficient. This dilemma as you can see is inextricably intertwined with the trade-offs dilemma and the government is in a delicate game of brinksmanship here.

The increasing costs of gas and electricity work to encourage recognition of appliance efficiency.

All other inflationary pressures work in the opposite direction.

The FEA will be posed a most delicate task.

To illustrate how delicate this task is, consider the following recent appliance industry history.

Over the past 20 years or so appliances were an increasingly better value at continuing lower price for consumers. The Consumer Price Index rose from 100, in 1958 to 187 in 1975—but the appliance price component *fell* from 100 in 1958 to 95 in 1973.

We produced and sold more appliances each year—reaching a peak in 1973 of 35,405,000 new appliances.

The appliances had more features which consumers wanted and a better service record than at any previous time in history.

The volume fell off from 35.4 million in 1973 to 24.2 million in 1975 and recovered to only about 25.8 million in 1976.

The Consumer Price Index for appliances went above 100 in 1974 and rose again in 1975 to 111. The prospects are for continued rises. These are cost-push rises. they are not demand-pull rises.

Cost-push increases can price the product beyond the reach of many consumers and discourage the replacement of inefficient, older products by other consumers.

In this setting, then, the energy developments which have impacted on appliance manufacturers are deeply significant!

AHAM POSITION ON S. 1469

Accordingly AHAM takes the following position on S. 1469:

ENERGY EFFICIENCY STANDARDS

Most of the members of AHAM have preferred averages to minimums as a more totally equitable, economically less disrupting and generally effective way of achieving appliance energy savings. However, our efforts to support this approach have been thwarted by the reluctance of the FEA to preempt state regulation on the basis of pending average targets. Furthermore, there has been no specific decision on FEA's part to accept (even with the right to audit any part of the reporting structure) industry reporting proposals. These utilize a third-party system already established and efficiently operating for the same basic purpose.

Thus, if FEA had made a prompt, precedent-setting example of the California legislation through preemption, other state actions would have been discouraged. Similarly, accepting the more simplified reporting methods proposed by industry would have eliminated the real concern for potential misuse of confidential data.

Failing these actions by the FEA, you now see most of the industry agreeing to minimums because they perceive this to be the only way to be assured of, first and most importantly, strong preemption and, second, less onerous reporting.

There does appear to be strong consensus among industry members that for two reasons minimums will take additional time to implement. First, it will take an estimated one year of additional time to change direction and develop technically feasible and economically sound minimums in a proper manner. Second, most of the change will occur among the lower-priced models of the various product lines because they are the least likely to meet the standard. In contrast, average improvement targets provide the flexibility to reduce energy anywhere in the line where it could be done fastest and most economically. Therefore, more time will be required to implement minimums.

Targeting a percentage improvement with minimums is difficult if not impossible. Each minimum must be based on a number of key considerations unique to each product line. In contrast, average improvements are based on applying better energy-saving techniques, materials or features across the entire line. Thus, compared to a base year (e.g., 1972), some percentage improvements can be rationally estimated.

Concerning the effect on consumers, minimums strongly tend to put most of the energy improvement burden on the low-income consumer.

In spite of all this, AHAM has changed its support to minimums for the primary reason of getting a strong preemption action by the Federal government. Without preemption, we have economic confusion of the highest sort.

If the actions desired by industry, mentioned earlier, were taken by the FEA, you would probably find a majority still in favor of averages.

PREEMPTION

As presently written S. 1469 does not contain any amendments to Section 327 of the Energy Policy and Conservation Act, the section that provides for Federal preemption of state regulation under certain circumstances. AHAM believes that, consistent with the statutory purpose of S. 1469 to command national standards for appliance energy conservation, Section 327 should be amended:

1. To have Federal law preempt *all* corresponding state regulation upon enactment of S. 1469 into law, and

2. To permit states thereafter to petition FEA for exemption from Federal law *but* only upon the strongest showing by the petitioning state that (a) there is a compelling state need for energy efficiency regulation which is different from Federal regulation, and (b) that such state regulation does not burden interstate commerce.

It should be noted that in the mark-up of H.R. 6831, counterpart legislation to S. 1469, the House Subcommittee on Energy and Power has amended Section 327 of EPCA in certain respects. AHAM supports those amendments, but we do not believe they go far enough. Specifically,

1. State regulation in existence prior to passage of H.R. 6831 would not be preempted by the House mark-up. We see no logical reason for this grandfather provision. If a national program regulating millions of consumer products moving in interstate commerce is to be uniform and even-handed in its application, every state should be equally impacted and appliance manufacturers should not be required, at the very outset of the national program, to design, manufacture and distribute applicances differently for grandfathered states.

2. The House mark-up perpetuates a most undersirable provision in existing law. One criterion upon which a state may now be granted exemption from preemption is that the state regulation is "more stringent" than a corresponding Federal standard. AHAM believes that such provision can fragment an effective national energy conservation program. The Federal government must be presumed to be capable of writing comprehensive and adequate national standards which will achieve national energy conservation goals. In a continuously escalating war of "stringency" the state with the most stringent standard will be setting the national standard. The Federal regulatory scheme, thus, will be frustrated and, in effect, preempted.

The sine qua non of an effective, successful national appliance energy program is Federal preemption of inconsistent or different state regulation of appliance efficiency. This requirement is critical; without it the U.S. appliance industry cannot deliver on its commitment to itself, to consumers and to government to achieve energy conservation.

We urge on this Subcommittee and on the Senate the importance of facing up to this issue squarely and at the outset. Our industry cannot serve more than one master, and if the Congress does not recognize this hard fact right now no cognizant government authority ever will. The result will be chaos—a jumble of conflicting "non-tariff barriers" around the respective states, each state competing against the others to see which can be the most protectionist on behalf of its citizens. Our national industry as we know it today will be radically reshaped—surely less efficient, surely less diverse, surely higher priced. We do not think the Constitution contemplates that result. We think U.S. consumers agree with us.

Partial preemption or ambiguous preemption is of no use to us. The Congressional purpose should be clearly and boldly stated, and the scheme of Federal preemption comprehensively defined in support of a workable national program.

Language to accomplish this purpose is proposed as Appendix 3.

DEVELOPMENT OF ENERGY EFFICIENCY STANDARDS

Because energy efficiency standards will have such a fundamental impact on all appliance manufacturers we urge the use of reasonable and sound procedures for developing such standards that include such characteristics as:

Economically sound to assure that cost increases are not so great as to cause consumers to make do with older, less efficient products rather than newer, more efficient products;

Technically feasible to give recognition to the inescapable limitations of the natural laws of physics, thermodynamics, electricity, etc., and to give recognition to the state of the engineering and manufacturing art for appliances;

Reasonably accomplishable to recognize adequately the necessary lead time for designing, tooling, producing and distributing appliances;

Suitable classification or categorization of product sub-groups within each kind of appliance (e.g., large, regular and compact washers; manual, partial automatic and automatic defrost refrigerator-freezers);

Identical classifications and sub-classifications for energy efficiency standards (FEA) and for labeling (FTC)

Energy efficiency standard values which include consumer options and other innovative energy-saving devices.

We particularly oppose the deletion of Section 336(a)(2) and (b)(5) of the current Act. We believe industry should have access to full due process during FEA's promulgation of energy efficiency standards.

We also seek sufficient lead time between the promulgation of energy efficiency standards and their effective date to allow for an orderly changeover of manufacturing facilities and the marketplace.

Finally, we note that proposed Section 325(a) eliminates the requirement in the present law that the National Bureau of Standards participate in the regulatory process. We strongly urge that NBS be given continued authority and responsibility in order to retain the accumulated experience and knowledge of that agency.

Accordingly, AHAM recommends additional amendments as outlined in Appendix 4 to this statement.

Thank you for providing us the opportunity to present our views.

Appendix 1

Major appliance members

Absocold
Addison
Arvin
Blackstone
Boston Stove
Broan
Carrier
Design & Manufacturing
Ebco
Fedders
  Airtemp
  Norge
  Fedders Refrigeration
Friedrich
General Electric, Major Appliance Business Group
General Motors
  Frigidaire Division
Gerling Moore
Glenwood Range
Hardwick Stove
Hoover
In-Sink-Erator Division of Emerson Electric
Jenn-Air
KitchenAid-Hobart
Litton
Magic Chef
  Gaffers & Sattler
Maytag
McGraw-Edison
  Air Comfort
  Modern Maid
  Speed Queen
  Intl. Metal Products
Natl. Union Electric
  Emerson Quiet-Kool
Preway
Revco
Rockwell International
  Admiral
Roper
Tappan
  Anaheim
  O'Keefe & Merritt
Vernco
West Bend
Whirlpool
White Consolidated Industries
  Athens Stove Works
  Franklin-Freezer Division
  Franklin-Laundry Division
  Gibson Products
    Belding
    Gibson Appliance
    Greenville Products
  Kelvinator
    GR Manufacturing
    Kelvinator Appliance
    Kelvinator Intl.
    Kelvinator Comm. Prods.
White-Westinghouse
  White-Westinghouse Appl.
  Columbus Products
  Mansfield Major Appliance
  Edison Products

PORTABLE APPLIANCE MEMBERS

Aluminum Specialty
American Electric
Arvin
Capitol Products
Clairol
Conair
Farberware
General Electric
Gillette
Hoover
Intermatic
KitchenAid-Hobart
Markel Electric
McGraw-Edison
  Port. Appl. & Tool
  Time Products
Metal Ware
Mirro Aluminum
National Presto
Regal Ware
Richmond Cedar
Rival
  Titan
Salton
SCM Corporation
  Proctor-Silex
Scovill
  Dominion
  Hamilton Beach
Son-Chief
  Black Angus
Sperry Remington
Sunbeam
  Oster
Superior Electric
Vita Mix
Waring
Wear-Ever
West Bend

APPENDIX 2

MAJOR APPLIANCES PRODUCTS

Compactors
Dehumidifiers
Dishwashers
Disposers
Clothes Dryers
Food Freezers
Humidifiers
Microwave Ovens
Ranges
Refrigerators
Room Air Conditioners
Clothes Washers

PORTABLE APPLIANCES PRODUCTS

Air Heaters
Blenders
Broilers
Can Openers
Clocks
Coffeemakers
Drip Coffeemakers
Coffee Mills
Coffeemaker Urns
Cookers—Egg
Cookers—Multi-Purpose
Corn Poppers
Curling Styling Wands
Fans
Fondues
Fry Pans (Skillets)
Griddles
Hair Dryers
Hair Setters
Hamburger/Sand. Grills
Heating Pads
Hot Lather Machines
Hot Plates
Ice Cream Freezers
Ice Crushers
Irons (Dry)
Irons (Steam & Spray)
Juicers
Kettles
Knives
Lighted Mirrors
Manicure Sets
Massagers
Mixers (Portable)
Mixers (Stand)
Shavers
Slow Cookers
Steam Clothes Wands
Styling Combs
Timers
Toasters
Waffle Irons
Warming Trays

APPENDIX 3

PREEMPTION WITH STATE APPEAL

Amend Section 327(a)(1) of the Energy Policy and Conservation Act to insert the phrase "upon enactment into law," after the word "part."

Strike current section 327(a)(2) through Section 327(b) of the Energy Policy and Conservation Act and substitute the following:

327(a)(2) "Any energy efficiency standard or similar requirement with respect to energy efficiency or energy use of a covered product, unless the State prescrib-

ing such standard demonstrates to the satisfaction of the Administrator and the Administrator find, by rule, that:

(A) (i) There is a compelling State or local need which is sufficient to justify such State regulation; and

(ii) such State regulation does not unduly burden interstate commerce.

(B) When there is a Federal energy efficiency standard applicable to such a product under section 325, the Administrator, for the purposes of determining whether a State regulation unduly burdens interstate commerce pursuant to this subsection, shall additionally, by rule, make appropriate findings in regard to the following criteria—

(i) the technological feasibility of complying with such regulation while, at the same time, complying with a corresponding Federal standard;

"(ii) the economic feasibility of complying with such regulation while, at the same time, complying with a corresponding Federal standard;

(iii) the additional cost, if any, to the manufacturer in complying with such State regulation;

(iv) the extent to which the national interest will be best served by a national uniform energy efficiency program for appliances; and

(v) the possibility of other States applying for an exemption from preexemption under this section for a State energy efficiency standard or similar requirement."

Appendix 4

AHAM recommended amendments to S. 1469 concerning determination of energy efficiency standards

The Administrator of the applicance program has the heavy responsibility of establishing energy efficiency standards. These standards, which will eliminate from the marketplace certain models of appliances, strike at the very heart of appliance manufacturers' business operations.

Therefore, AHAM believes it is incumbent upon the Congress to establish clear, unambiguous guidelines on criteria for energy efficiency standards to the Administration, provide for close consultation with the businesses, consumers and others affected by these standards, and maintain due process safeguards in standards promulgation procedures. These need not be lengthy if properly administered. They must be thorough and of adequate depth to bring out relevant factors involved.

To this end AHAM suggests the following language be incorporated into Section 201 of S. 1469[1]:

"*(a) Section 323(c) of the Energy Policy and Conservation Act is amended to delete '90' in the first line and insert 'for units manufactured 180' in lieu thereof.*"

"*(b) Section 324(c)(2)(A) of the Energy Policy and Conservation Act is amended to add the sentence 'Identical categories or subcategories of products shall be used for labeling, required in the section, and for standards, required in Section 325,' at the close of this paragraph.*",

"Section 325(a) of the Energy Policy and Conservation Act is amended to read as follows:

"(a)(1)(A) Except as otherwise provided in paragraph (3), the Administrator shall, by rule, prescribe an energy efficiency standard for each type or class of covered product specified in paragraphs (1), (2), (5), (6), (9), (12), and (13) of section 322(a). The Administrator shall direct the National Bureau of Standards to develop the energy efficiency standards specified in this subsection.

"(B) The Admistrator may, by rule, prescribe an energy efficiency standard for any type or class of covered products of each of the types specified in paragraphs (3), (4), (7), (8), (10), (11), and (14) of section 322(a), except that the Administrator may not prescribe an energy efficiency standard for a type or class of covered product described in paragraph (14) of section 322(a) unless he determines that—

"(A)(i) average per household energy use by products of such type exceeds 150 kilowatt-hours (or its Btu equivalent) per year;

"(ii) aggregate household energy use by products of such type exceeds 4,200,000,000 kilowatt-hours per year; and

"(iii) sustantial improvement in the energy efficiency of products of such type is possible.

[1] AHAM suggested language appears in italic.

"(2) No standard for a type (or class) of covered product shall be prescribed pursuant to paargraph (1) unless a test procedure has been prescribed pursuant to section 323 with respect to that type (or class) off product.

"(3) The Administrator shall not prescribe an energy efficiency standard for a type or class of covered product if he determines that the establishment of such standard is not technologically feasible or not economically justified.

"(4) Energy efficiency standards established pursuant to this section shall be designed to achieve the maximum improvement in energy efficiency which the Administrator determines is technologically feasible and economically justified, and may be phased in over a period of years, through the establishment of intermediate standards. Effective dates for each energy efficiency standard, be it an ultimate or intermediate standards, shall be established to recognize reasonable leadtimes necessary to allow manufacturers to accomplish the design, tooling, and production changes necessary to meet requirements of the standard.

"(5) In determining whether a standard is technically feasible and economically justified pursuant to paragraph (3) or (4), the Adminitrator shall consider—

"(*A*) *the state of the art of appliance engineering and manufacturing,*

(*B*) the economic impact of the standard,

(*C*) the total projected amount of energy savings likely to result from the imposition of the standard,

(*D*) the savings in operating costs throughout the estimated average life of covered products in the type or class, compared to any increase in the price of or in initial charges for, or maintenance expenses of, the covered product which is likely to result from the imposition of the standard,

(*E*) any lessening of the utility or the performance of the covered product likely to result from the imposition of the standard,

(*F*) *product features which provide the consumer with energy-saving options,*

(*G*) any negative effects on competition likely to result from the imposition of the standard,

(*H*) *the impact of increases in initial cost of the product so as to preclude discouraging consumers from replacing inefficient appliances with more efficient models,*

"(*I*) the need of the Nation to conserve energy, and

(*J*) any other factors he considers relevant.

"(6) A rule prescribing an energy efficiency standard for a type or class of covered product may, for not more than two years, exempt, in whole or in part, from its requirements manufacturers of covered products whose gross revenues from all operations (including but not limited to the manufacture and sale of covered products) do not exceed $8,000,000 per annum, as determined by the Administrator, and with respect to the standard may result in a substantial lessening of competition.

"(7) A rule prescribing an energy efficiency standard for a type or class of covered product may *shall* specify different minimum levels of energy efficiency of covered products within such type class based upon:

(*A*) the kind of energy consumed by such covered products and

(*B*) *shall specify different minimum levels of efficiency for subcategories of covered products based upon:*

(*i*) *size or capacity differences,*

(*ii*) *utility or performance,*

(*iii*) *fundamental design differences of such covered products.*

"Identical categories or subcategories established under this section shall be used for product labeling under section 324.

"(8) The Administrator shall, not later than five years after promulgation of an energy efficiency standard, conduct a reevaluation in order to determine whether such standard should be modified. In conducting such reevaluation the Administrator shall take into account such information as he deems relevant, including technological developments with respect to the manufacture of the type or class of covered product involved and the economic impact of the standard."

"(*d*) Section 425(b) of the Energy Policy and Conservation Act is amended by redesignating paragraphs (2) and (3) as paragraph (3) and (4) respectively, and inserting a new paragraph (2) to read as follows:

"(2) With respect to covered products of each of the types specified in section 325(a)(1)(A), an advance notice of proposed rulemaking with respect to such type or class of covered product shall be promulgated by the Administrator not

later than 30 days after a test procedure with respect to that type or class of covered product has been prescribed, or 30 days after enactment of the National Energy Act, whichever is later."

Newly designated (4) is amended to delete "180 days" and substitute therefor "not earlier than one year."

"(c) Part B of Title III of the Energy Policy and Conservation Act is further amended as follows:

"(1) Section 324(c)(5) is amended by inserting ', including instructions for the maintenance, use, or repair of the covered product,' after 'energy consumption' in the matter following subparagraph (C).

"(2) Section 325(d) is deleted.

"(3) Section 326 is amended by adding a new subsection (d) *and (e)*, to read as follows:

"(d) The Administrator may require each manufacturer of covered products to submit such information or reports with respect to energy efficiency of such covered products as the Administrator determines may be necessary to establish standards under section 325.

"*(e) Upon a showing satisfactory to the Federal Energy Administrator by any person that any energy information obtained under this section from such person would, if made public, divulge methods or processes entitled to protection as trade secrets or other proprietary information of such person, such information, or portion thereof, shall be confidential in accordance with the provisions of section 1905 of Title 18; except that such information, or part thereof, shall not be deemed confidential for purposes of disclosure, upon request, to (i) any delegate of the Federal "Energy Administrator for the purpose of carrying out this chapter, (ii) the Federal Trade Commission, when necessary to carry out that agency's duties and responsibilities under this and other statutes, and (iii) the Congress, or any committee of Congress upon request of the Chairman.*"

"(4) Section 336(a)(1) is amended by (A) striking out '(1)' and (B) by striking out '325(a) (1), (2), or (3)' in the first sentence thereof and inserting in lieu thereof the following: '325(a)'.

"(5) Section 336(a)(1)(B) is amended by striking out 'paragraph (1), (2), or (3) of' in the first sentence thereof.

"(6) Section 336(a)(2) is *amended by striking out the parenthetical phrase '(other than subsections (a) (1), (2), and (3))'.*

"(7) Sections 336(b) (1) and (2) are amended by striking out 'section 323 or 324' and inserting in lieu thereof 'section 323, 324, or 325'.

"(8) Section 336(b)(5) is *amended by striking out the parenthetical phrase '(other than subsections (a) (1), (2), and (3))'.*

"(9) Section 339(a) is amended to read as follows:

"(a) There are authorized to be appropriated to the Administrator to carry out his responsibilities under this part not to exceed $1,700,000 for fiscal year 1976, not to exceed $3,056,000 for fiscal year 1977, and for each fiscal year thereafter such sums as may be necessary."

Senator JOHNSTON. Mr. Munger.

STATEMENT OF G. R. MUNGER, PRESIDENT, AIR CONDITIONING & REFRIGERATION INSTITUTE

Mr. MUNGER. I shall be brief. Senator, you asked Mr. Loberg of AGA this morning, how can we certify the insulation and a number of other things. The national voluntary laboratory accreditation program, which is a child of the NBS, has thermal insulation as its first trial product.

Our trade association has, since 1959, had a certification program for central residential air-conditioners. We publish this directory twice a year. Certification can be done by industry on a voluntary basis.

We have two primary concerns about the proposed bill. One is labeling. The equipment we manufacture is classified as an appliance such as Mr. Baumgart's. His consumers unpackage the thing and plug it in. Ours need a contractor to design the system and put it in the home.

Our manufacturer does not know where it is going to go, does not know the weather conditions, the hours of operation, or the utility rates so the manufacturer cannot advise the buyer of the product about the operating cost.

We think that it is critical that the manufacturer should provide the necessary information to the local contractor to do that.

The other major concern we have is the mandatory aspects of minimum efficiency standards.

Last week, our board of directors made what we consider a major change in policy. We believe, as Senator Jackson said this morning, that there ought to be some freedom of choice left in this country and we have stood firm on freedom of choice of equipment selection. The public should be able to buy a less-expensive, less-efficient piece of equipment, but we recognize the time has come where we have to face up to mandatory standards and we support that.

We agree with many of the caveats Mr. Loberg stated. Mandatory standards must be totally preemptive or they will disrupt the industry terribly. The time to design more efficient equipment is critical. If standards are set too high, they can be disruptive to the industry and to the public.

We also believe the idea of operating savings paying back the initial increased cost over the life of the equipment is not realistic. Most of us would not buy something that is more expensive, if it did not pay us back in 2 or 3 years, not the life of the equipment. We think that is important to look at.

The industry is making great strides; in 1976, 28.5 percent of our available products met the 7.0 California energy efficiency standard. In 1977, 42.1 percent met it. This is tremendous progress, but that effort has been made over about a 4-year period.

The last point I wish to make is that we agree totally with Mr. Baumgart regarding NBS being put back in the picture. NBS is infiltrated with competent people. They are one of the very best parts of the Federal Government. I think to take them out of the picture would be a crime.

Senator JOHNSTON. Thank you very much.

[The prepared statement of Mr. Munger and appendixes follow:]

TESTIMONY OF G. R. MUNGER, PRESIDENT, AIR-CONDITIONING & REFRIGERATION INSTITUTE

My name is G. R. Munger. I am submitting this statement to the Subcommittee on behalf of the Air-Conditioning and Refrigeration Institute (ARI), which I serve as President. I am a graduate of California State Polytechnic College, hold a B.S. degree in Engineering, and have extensive experience in the air-conditioning and refrigeration industry, as well as in the thermal insulation building materials and plastics industries.

ARI FUNCTIONS AND ACTIVITIES

The Air-Conditioning and Refrigeration Institute (ARI) is a trade association whose members manufacture more than 90 percent of all U.S.-made air-conditioning and refrigeration equipment (other than household appliances such as room air conditioners, dehumidifiers, refrigerators and freezers) and products and components which become a part of that equipment. Equipment manufactured by ARI member-companies which is within the scope of P.L. 94–163, and therefore within the scope of S. 1469, includes unitary (central residential) air conditioners, central humidifiers and those package terminal air

conditioners which are applied in dwelling units. ARI expects that unitary (central residential) heat pumps will be classified by the Federal Energy Administration in Category 14 of Section 322(a) of P.L. 94–163 and that they will fall, therefore, within the scope of S. 1469.

ARI publishes rating standards for equipment within its product scope and administers programs through which participating manufacturers may certify the operating characteristics of their products. These certification programs date back to 1959, when this industry first established voluntary programs to assure consumers of accurate capacity ratings for central air-conditioning equipment. Today ARI administers 11 certification programs for such diverse products as unitary air-conditioners, transport refrigeration units, humidifiers and drinking water coolers.

Information derived from each certification program is disseminated to that part of the air-conditioning and refrigeration industry which uses that product. For example, designers and installers of central cooling units are able to purchase equipment on the basis of energy efficiency and overall performance by referring to the ARI Directory of Unitary Air Conditoners and Heat Pumps. This Directory shows electrical input (expressed in watts) and Btu output, together with energy efficiency number (EER), for the more than 6,700 different models of these products. The Directory is supplied by ARI to over 30,000 engineers, builders, contractors, architects, utilities, government agencies and technical schools. The EER number is calculated by dividing watts into Btuh at the rating test conditions.

AIR CONDITIONING IN TODAY'S AMERICA

The years of the past half century, have been called by many names—the age of automation, the atomic era, the space age, and many others. Wonder drugs, jet propulsion, manmade satellites, computers, and marvelous plastics that can be made into a wide range of products (from a lady's most sheer garments to durable and long-lasting flooring materials)—all these are a part of our age.

None of these developments would have been possible without the modern miracle of mechanical refrigeration and its offspring air conditioning. Few industries in America have a more vital role in the protection of our Nation's health and well-being than the air-conditioning and refrigeration industry. Few affect the lives of so many Americans.

Our great progress in electronics, in optics, in nuclear power, in close-tolerance precision production, in aircraft and missile production and control, any many other industries and arts upon which our national welfare depends would be impossible without controlled conditions of "climate". The commercial and industrial areas of our towns and cities would be impossible to occupy without these controlled conditions of "climate".

Air conditioning in residences, to which S. 1469 is addressed, has become a commonplace in most of America and a near-necessity in much of it.

More than three-quarters of the food we eat is dependent upon refrigeration for reaching our tables in a healthful and palatable state. Our food supply is refrigerated from the time it leaves the producers through transportation, storage, distribution and finally, sale to the consumer and storage in the kitchen refrigerator. Furthermore, refrigeration is essential to the production of pharmaceuticals and biological products which maintain our Nation's health.

Air conditioning and refrigeration include a number of categories of use, but only one of them—residential heating and cooling—is addressed in S. 1469. We believe it is important to point out that residential air conditioning consumes between 2 and 3 percent of all energy used annually in the United States. In 1972 the electricity used for this purpose was about 34.8 billion kwh, which was about 2.2 percent of all U.S. electrical consumption. For a number of years, it has been a rapidly growing factor in the residential sector. Between 1968 and 1972, it increased by 15 billion kwh.

The figures indicate clearly that improved efficiency in the design, operation and maintenance of new and existing residences can contribute significantly to the national energy conservation objective.

VIEWS ON S. 1469

1. General

ARI is in full agreement with the statement of need as expressed in the Findings of S. 1469. Specifically, as stated in Section 2 of the bill, our members are

convinced, and for several years have been proceeding on the premise, that the United States faces an energy shortage, that effective measures must be taken to reduce the rate of growth of demand for energy, and that it is essential for the United States to carry out an effective conservation and efficiency program in all sectors of energy use.

Furthermore, we believe that in order to meet the energy goals set out in S. 1469, air conditioning in residences must be manufactured, and systems designed and operated, so as to achieve optimum energy utilization.

We believe it is appropriate, and in fact urgent, to enact additional legislation dealing with energy use. In enacting this legislation, Congress and the agencies directed to carry out laws on this subject should be careful to establish reasonable and attainable energy efficiency programs. It is not in the public interest to legislate programs which, considering the present state of the art, are impracticable or unfeasible to attain. Such programs would not achieve these objectives.

It must be remembered that the manufacture of air-conditioning equipment which is more efficient in conserving energy will require the use of increased quantities of energy-intensive and frequently scarce materials. The cost of the additional energy used in the production of these materials will be reflected in the cost of more efficient products. We believe that Congress, including the Subcommittee on Energy Conservation and Regulation, must keep in mind that economics will encourage a constructive balance between the increased requirement of these energy-intensive materials and the decreased energy requirement of more efficient products. The need for substantial additional amounts of copper and aluminum in central air conditioners as they are made more energy-efficient is well established. Tubing, fins, larger evaporators and condenser coils all would require more of these metals.

2. The Central Air-Conditioning System

Part B of Public Law 94–163 applies to "consumer products", and in Section 321 (a) (1) defines these to mean articles, other than automobiles, which in operation consume, or are designed to consume, energy, and which, to any significant extent, are distributed in commerce for personal use or consumption by individuals. In Section 322(a), central air conditioners and humidifiers for residences are listed among "covered" consumer products to which Part B applies. Part B of S. 1469 would amend these provisions.

It is important to understand that, even though central air conditioners and humidifiers are listed as consumer products in P.L. 94–163, these products differ from the usual conception of a consumer product. Consumer products are commonly thought of as factory-finished entities, ready to be unpacked and put to use by the purchaser. It is usually felt that such products require little, if any, additional processing beyond that which the product's manufacturer performs in his factory.

ARI calls to the attention of the subcommittee that the products of its members cannot perform their intended function until they are fully installed in the residence. They must become a part of a functioning air-duct system within the home of a consumer.

Most equipment manufacturers in the air-conditioning industry sell their products to distributors or wholesalers, who in turn sell to retailing and installing contractors. In the normal course of business, manufacturers do not specify or select equipment for a specific home installation. Neither do they install their products in the homes of the ultimate purchaser. Instead, the system components are selected, sold and installed in the consumer's home by the installer-contractor. It is this retailer to whom the consumer must look, and upon whom he must rely, for selecting equipment of the proper type and capacity required to provide comfort in his home.

ARI points out that the retailer does more than select, sell and install equipment. He first makes a survey and performs calculations involving the residence in which the installation is to be made. From this process, he determines the type and capacity of equipment which is needed. He selects the specific products which will become part of the air-conditioning system. These often may include products of different manufacturers—an air-conditioning unit from one manufacturer, a humidifier from a second, and perhaps a filter from a third. The contractor designs, fabricates and installs an air-duct system which will carry the correct quantity of conditioned air to each room in the home. He makes appropriate utility connections, and he starts and adjusts the system for proper operation. In effect,

this retailer-contractor manufactures the air-conditioning system on the consumer's premises.

The skill of the contractor in carrying out this manufacturing process is directly connected with the consumption of electricity by the air-conditioning system. He should employ his basic engineering skills to calculate the size of the unit needed, and to calculate properly the size of the air ducts. His decisions in selecting the type of wiring, the type of outlet and the routing of ducts throughout the floor plan of the home all are vital to the ultimate efficiency of the system and have a significant effect on the amount of energy which the system will consume.

Concerned though he must be about the ultimate disposition of his products, the equipment manufacturer can exert no control over any sale except the one he himself makes to the distributor of his products. Speaking generally, he cannot control the distributor's sale to the retailer-contractor, nor can be control the distributor's sale to the consumer. It is important, therefore, that the Subcommittee realizes that the air-conditioning equipment installed in the structure is only a component of the system which is a part of that structure. For each such system, there are at least four distinct stages in which decisions affecting energy consumption are made. These include:

1. Design of the structure suitable for its intended use and of compatible systems, which includes selection of equipment required for these systems;
2. Installation of the systems, including their components;
3. Operation of the systems, and
4. Maintenance of the systems.

Although all of these functions can be performed by one person or business, it is far more frequent for a given person or business to perform only one or two of them. As a consequence, the manufacturers of system components usually have no direct control over the proper application, installation, operation and maintenance of their products. In new residences, the building may be designed by an architect or, more commonly, built to a plan which the builder has used previously. An air-conditioning contractor will select the equipment and install the system within the price and other constraints imposed by the builder. In placing new equipment or systems in existing residences these same constraints will be imposed by the owner—who may also be the occupant. In both new and existing residences, the systems will be operated by the occupants and maintenance will be at the whim of the owner. The manner in which each of these functions is performed will substantially affect the amount of energy consumed by the system.

For these reasons ARI believes that the Energy Policy and Conservation Act of 1975 should not require labeling which gives annual operating cost information to the consumer. The complexity of these products, the manner in which they are marketed and the manner in which they are used in the home makes them so different from most other appliances covered under this statute that the annual operating cost requirement is not a fair one. It will be very difficult to express on a label the operating cost of the finished system without providing wrong information most of the time. The manufacturer of the equipment is in no position to know the type of structure, much less its design heat loss and heat gain, its location, or its type of occupancy when he completes his manufacturing process and ships it to a distributor, who in turn will sell it to a retailer-contractor.

We believe that the annual operating cost requirement can give a fast-talking salesman a "legal" opportunity to stretch and misrepresent the facts in a manner which will confuse the customer. A label which attempts to do more than provide the ultimate consumer with equipment operating characteristics is not, in our opinion, in the best interest of that consumer. The procedure set up in Section 324 (c), when applied to central air conditioners, heat pumps and humidifiers, has real potential for misleading and misinforming the buyer of a completed system.

In view of this, we recommend that the Energy Policy and Conservation Act of 1975 be amended to provide that the provisions of Section 324(c)(1)(A) not apply to Section 322(a), Subparagraphs (11), (12) and (14), assuming that heat pumps are to be classified by the Federal Energy Administrator in the last mentioned subparagraph. We favor disclosure of a "useful measure of energy consumption" (determined in accordance with test procedures described under Section 323), but we do not believe that annual operating cost will be at all helpful to the ultimate consumer. Rather, it will mislead and misinform him.

3. *Disclosure of Equipment Characteristics*

ARI has taken the position, from the earliest signs that an energy shortage was on the horizon, that information about the energy consumption characteristics of

its products and systems should be made available to their users. In views furnished to both House and Senate committees during the past several years, we have advocated that this information be provided to the consumer by the person or persons responsible for the final design and/or assembly of the system, Through ARI publications already described, we make efficiency information, including EER numbers, available to both designers and installers of air-conditioning systems. This information will be of assistance as the labeling program envisioned in P.L. 94–163 goes forward.

But ARI fears that the energy labeling required under Section 324(c)(1) will, under the present provisions of this statute, prove to be of only limited benefit. The Subcommittee should understand, for example, that the consumer rarely purchases a central air conditioner under circumstances in which he even sees labels which could give him the information which the statute requires be placed on the label. If he saw such a label, it might be possible for him to compare the product he is considering with those of other manufacturers he might consider.

Few retailers of air-conditioning systems display such systems or their components. The retailer, instead, typically will order the components from a distributor after he decides which components to use in the system that will adequately serve the consumer. It is highly unlikely that, prior to installation, the consumer will have an opportunity to inspect a label on an air-conditioning unit relating to the components which will go into his system. Only a few large retailing organizations which sell central residential air conditioners will display models on their sales floor. Even then the display will feature only a small number of sample models.

If a consumer buys a new home, he usually has little or no voice in the selection of an air conditioner. Usually the developer specifies this, and the buyer moves into the finished home with all the equipment installed. Only in a custom-designed and built home is he likely to have any knowledge of or control over which components might be used in an air-conditioning system, and such homes are rare and expensive.

For these reasons, ARI believes that the Energy Policy and Conservation Act of 1975 should provide in Section 324 that the equipment manufacturer be required to furnish the operating characteristics of his equipment, model by model, to the distributor, and that it thence be given to the retailer-contractor in order that the latter may have full information to use as he designs the system for ultimate installation in the residence. Furthermore, we believe the retailer-contractor should be required to provide this information to the owner of the residence—at least in those instances when the contractor is dealing with the owner who is a present or potential occupant of the residence—in advance of the time the equipment is installed, in order that the owner may compare the efficiency of the finished system with other alternativs.

4. Mandatory Efficiency Standards

ARI supports the provisions of S. 1469, beginning with Section 201, which would bring about the establishment of energy efficiency standards for air-conditioning equipment.

ARI believes that several elements are essential as an integral part of any program establishing these energy efficiency standards, as follows:

a. It is vital that the authority for setting energy efficiency standards be reserved solely to the Federal Government, and that any such standards previously established by any agency in the government, State or local, or any regulated private organization, be immediately revoked. Many different energy efficiency standards would cause substantially increased costs for consumers, reduced employment and be an overall deterrent to interstate commerce.

We believe that the language in Section 327 of Public Law 94–163 is not strong enough and should be amended so as to clearly establish that minimum efficiency standards established by FEA or any successor agency will preempt any current or future State or local energy efficiency standard.

In the Energy Policy and Conservation Act of 1975 (P.L. 94–163), Congress has already indicated its agreement with this position, and shows it understands that manufacturers of complex consumer-type products can effectively contribute to the solution of our energy problem only if they have one set of guidelines to follow. However, we must report that the Federal Energy Administration is not, in our view, following the Congressional intent in this crucial matter.

We recommend that the statute be promptly clarified to prevent the nullification of Congressional intent by the bureaucracy.

Section 327(a)(2) requires the preemption of any State energy efficiency standard which is not "identical" to a Federal standard. But no Federal standard is now expected for central air conditioners until 1979 or 1980.

In the meantime, the States are acting with good intentions, but in varying ways, to fill in the vacuum thus created. On November 3, 1976, California adopted a regulation forbidding the sale, after November 3, 1977, of central air conditioners having an EER substantially higher than presently can be obtained by most of the industry. Through ARI, the industry accordingly petitioned the Federal Energy Administration to preempt this regulation by suspending its operation until the Federal standard could be adopted. FEA has refused to do this, on the grounds that the requirements of Section 327(b)(1), which apply to this interim period, have not been complied with. The applicable sentence of Section 327(b)(1) reads as follows:

"The Administrators shall issue such a rule with respect to a State regulation if and only if the petitioner demonstrates *to the satisfaction of the Administrator* that—

(A) There is no significant State or local interest to justify such State regulation; *and*

(B) Such State regulation unduly burdens interstate commerce," (Emphasis added.)

Attached as Appendix A to this statement is the petition filed by the air-conditioning industry in this matter. FEA denied this petition on June 10, 1977, by letter, copy of which is attached as Appendix B.

Also attached as Appendix C is the *Federal Register* notice of June 13, 1977—to which the FEA referred in its earlier (though undated) letter—which sets forth preliminary rules on such petitions. The proposed rules suggest a tedious, burdensome, three-stage procedure which would require each manufacturer to petition separately, to prepare an environmental impact statement and to disclose—and lay upon the public record—sales data giving both numbers of products and dollar volumes of sales in that State and of sales in all of its markets. The effect of such rules on affected manufacturers, those to whom doors to major markets have been closed, will be chilling indeed.

We think the Subcommittee and its legal advisors will agree that FEA has failed to follow the Congressional intent in this matter.

To correct this situation, we suggest that the language of the statute which we have quoted be amended, as promptly as possible, to read as follows:

"The Administrator shall issue such a rule with respect to a State regulation if the petitioner demonstrates that—

(A) There is no significant State or local interest sufficient to justify such State regulation; *or that*

(B) Such State regulation unduly burdens interstate commerce."

Further, we suggest that the time period within which FEA must act under Section 327(b)(1) be changed from six months to 60 days, in order to shorten the duration of the disruption of the industry which is now occurring.

Finally, we submit that in order to prevent unbridled administrative action in this crucial matter, judicial review should be explicitly provided for. In our opinion, Congress intended that the final word as to the effect of the Supremacy Clause of the Constitution, in this or any other context, must rest in the courts.

We point here to the final paragraph of FEA's letter denying ARI's petition for preemption (Appendix B), which reads, in part, as follows:

"This decision is a final decision and action for all purposes, including judicial review. There is no administrative review or appeal * * * "

We submit that judicial review can be explicitly provided for in the statute by expressly including the relevant portion of Section 327(b) in Section 336(b)(1). Section 336(b)(1) would then read as follows:

"Any person who will be adversely affected by a rule prescribed under Section 323 or 324 when it is effective, *or by a rule (or denial of a petition for a rule) under Section 327(b)*, may, at any time prior to the sixtieth day, after the date such rule is prescribed, file a petition with the United States Court of Appeals for the circuit wherein such person resides or has his principal place of business, for a judicial review thereof. * * *" (New language shown by italic which has been added.)

In our opinion, the addition of such language is needed to clarify the Congressional intent as we understand it.

If we are to have these minimum efficiency standards, we believe it is very important to have a single set of them. If the industry has to deal with a number of

different standards at State and local levels, as well as at the Federal level, and a number of different test procedures under different conditions as well, it will be much more difficult and expensive to deal with the problem. The consumer must ultimately pay this bill.

The Subcommittee should understand that at present the State of California has its own set of minimum efficiency standards for central air-conditioning. At the same time, more than 20 other States are giving serious consideration to legislation of this kind. The New Jersey legislature is considering a bill that would require minimum efficiencies, increasing in three steps over a four-year period, and the Kansas State Corporation Commission has announced it intends to order regulated utilities to include minimum standards in their tariffs. It extends even further, for Sacramento County, California, has proposed standards, and the Atlantic City (N.J.) Electric Company has included standards in a newly approved tariff.

If P.L. 94–163 is not amended so as to provide for total preemptive relief on these standards, it is entirely possible that every manufacturer of air-conditioning will have to build a special line of products for each State in which it wants to do business. The burden and expense of such a system will ultimately be borne by the consumer. The impact on his pocketbook will be heavy. The need for a special labeling system for each such State, as well as new distribution cost, will be increased in order to meet the various State requirements which such legislation will dictate.

These extra costs to users will include not only the cost of original equipment, but also the cost of repair parts and services as a result of the non-uniformity which a lack of preemption will bring about. In addition, there will be increased costs to taxpayers in each State for the establishment and maintenance of State regulatory agencies. The total cost will be significantly greater than that required if a single Federal agency sets standards.

In addition, a failure to preempt State and local laws and regulations will bring about reduced employment. Larger manufacturers, who now sell in each State may not be able to afford the manufacture of different models and types in a large number of sizes because of specific requirements in an individual State. They may be forced, therefore, to withdraw from markets in that State, thereby reducing their production and their employment. Furthermore, some smaller manufacturers, who do not sell nationally, but do sell in more than one State, may be unable to cope at all with a large number of differing requirements, and may therefore be forced to cease their manufacturing operations.

Similarly, architects and engineers who design buildings and the energy-consuming systems included in those buildings will be forced to use different design criteria and calculation procedures in different States.

ARI points out that since August, 1975, a standard containing energy-efficient design specifications for new buildings has been available to engineers and designers. This standard was issued by the American Society of yeating, Refrigerating and Air-Conditioning Engineers (ASHRAE), with assistance from a multitude of other organizations and Federal government agencies. ASHRAE Standard 90 provides a basis for a single, uniform guideline for energy-efficient buildup, and for energy-consuming equipment within them. ASHRAE is now engaged in developing a series of similar standards for retrofitting existing buildings of all types.

The air-conditioning and refrigeration industry believes that strong Federal preemptive legislation is far preferable to a myriad of conflicting State and local laws and regulations. Such Federal law should preempt all rules, regulations and laws which conflict with Federal law in any way whatsoever.

b. ARI believes that the system of energy efficiency standards, which S. 1469 envisions, must be based on the premise that a just and equitable rulemaking procedure will be used to establish standards which are technologically feasible and economically justified for the different classes of products within each type covered by P.L. 94–163. The state of the engineering and manufacturing art for air-conditioning equipment must be recognized in a finding that these standards are economically sound, for otherwise consumers will decide not to buy the newer and more efficient products, but will continue with the older, less efficient products which they have on hand. We believe that the added cost of more efficient products will be accepted by consumers only if their energy savings pay back that added cost in two or, at most, three years.

We believe that this rulemaking process should be the procedure presently required by P.L. 94–163. We urge the Subcommittee not to delete Sections 336(a) (2)

and (b) (5) of this law. Industry should have complete and full access to the due process procedure described in the current law while it is engaging in the establishment of energy efficiency standards with FEA or a successor agency.

ARI believes that the National Bureau of Standards should continue to be a part of the rulemaking process which will establish minimum efficiency standards. Section 325(a) (1) (A) of P.L. 94–163, as amended by P.L. 94–385, provides that the National Bureau of Standards will develop, at the direction of the Federal Energy Administrator, the energy efficiency improvement targets for covered products. S. 1469 eliminates the energy target program and removes the National Bureau of Standards from any responsibility in the program. We urge the Subcommittee to restore the Bureau of Standards to the program and to give it continued authority and responsibility in the establishment of minimum efficiency standards. The Bureau has laboratory facilities, and its staff has a great deal of knowledge and experience which can be vital in establishing a successful program of this type.

c. ARI believes that the legislation calling for energy efficiency standards should provide that they become effective only after manufacturers have been allowed sufficient time to design, test, manufacture, obtain required safety approvals and deliver to the marketplace reliable products which comply with these standards.

ARI believes a period of five years is required to carry out these elements of the manufacturing and marketing process for a new product line. Two to three years is required for the development of a single model. It was almost five years ago that some manufacturers foresaw the possibility of an approaching energy crisis and started the study and design of more energy-efficient components and complete units. Models derived directly from those foresighted decisions are just now starting to reach the marketplace. More—this trade association does not know how many—will probably be emerging from the design and prototype stages and reaching the marketplace during the next year or two. If the Federal authorities develop a reasonable and attainable standard, it is possible that this 3–5 year period can be somewhat compressed.

One of the major time constraints is institutional in nature—that of obtaining independent testing laboratory approval. It must be understood that each model in a product line—similarly designed equipment having similar EER numbers and with a model in each of several cooling capacities—must be tested and receive the approval of such an independent laboratory. These laboratories test for safety; they do not test for capacity.

Some components of air conditioners and heat pumps require a similar time for the development of new, more efficient models. The refrigeration compressor is an example, for manufacturers require that compressors have an expected service life of at least 10,000 hours. Until a compressor has been tested and approved, it cannot be considered for use in a new model.

ARI favors the concept of intermediate standards, as described in Section 201 (a) (4) (p. 23 of the Subcommittee print) in principle. This language appears to recognize the problems of bringing a model or a product line into the marketplace, as described above. "Phasing" a more efficient line into the market through the establishment of intermediate standards may be feasible and helpful.

But our approval of the intermediate standards concept is tempered with an important proviso. We would not favor this concept if it means the Federal authorities would establish an intermediate standard which might be technologically feasible but not yet economically justified. If a manufacturer were forced to retool on the basis of an intermediate standard, but could not pay off these capital costs in lesser production that might occur before a higher, later standard was put into effect, he would be hurt badly. Industry should have some assurance about the length of time which intermediate standards would be in effect.

d. ARI urges that sufficient time be allowed not only for the production of complying equipment, but also to allow products not complying to be cleared from factory and field inventories. Furthermore, we urge that energy efficiency standards specify a date after which non-complying products cannot be manufactured.

SUMMARY

1. Air-conditioning is vital in science, manufacturing, commerce and our homes in today's America.

2. ARI agrees that the United States faces an energy shortage and that an effective conservation and efficiency program in the energy area is needed.

3. Air conditioners, heat pumps and humidifiers consume significant amounts of energy and are being designed to be more energy-efficient; in the future still more efficient models will reach the market.

4. Annual operating cost information on labels placed on air-conditioning systems components will not be helpful; to the contrary, it will mislead and deceive many consumers. This requirement of P.L. 94–163 need, therefore, to be strengthened. The same provisions should more clearly provide for judicial review of Federal actions during the establishment of these standards.

b. The rulemaking procedures presently required under P.L. 94–163 is continued when this statute is amended to require these standards.

c. Efficiency standards should become effective only after sufficient time has been allowed to design, manufacture, test, obtain required safety approvals and deliver them to the market place. Interim standards can be useful if they are both technically feasible and economically justified.

d. Sufficient time should be allowed to clear products in the "pipeline" before efficiency standards go into effect.

CONCLUSION

ARI hopes that its expression of opinion on the provisions of S. 1469 has been constructive and will be of value to the Subcommittee. It stands ready to provide any needed information upon request.

APPENDIX A

Before the

FEDERAL ENERGY ADMINISTRATION

Petition for the Prescription of a Rule to Supersede Regulations of the State of California for Minimum Levels of Operating Efficiency for Central Airconditioners and Heat Pumps

On behalf of—

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DUNHAM-BUSH, INC., 175 SOUTH STREET, WEST HARTFORD, CONNECTICUT 06110

FRASER & JOHNSTON COMPANY, 2222 GRANT AVENUE, SAN LORENZO, CALIFORNIA 94580

GENERAL ELECTRIC COMPANY, APPLIANCE PARK, LOUISVILLE, KENTUCKY 40225

HEIL QUAKER CORPORATION, 635 THOMPSON LANE, NASHVILLE, TENNESSEE 37204

LENNOX INDUSTRIES, INC., 200 SOUTH 12TH AVENUE, MARSHALLTOWN, IOWA 50158

LUXAIRE, INC., WEST OF FILBERT STREET, ELYRIA, OHIO 44035

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Before the Federal Energy Administration

Petition of Air-Conditioning and Refrigeration Institute, et al. for the Prescription of a Rule to Supersede Regulations of the State of California for Minimum Levels of Operating Efficiency for Central Air-Conditioners and Heat Pumps

I. INTEREST OF PETITIONERS

Petitioner Air-Conditioning and Refrigeration Institute (ARI) is a trade association whose members manufacture more than 90 percent of all U.S. made air-conditioning and refrigeration equipment (other than household appliances such as room air-conditioners, dehumidifiers, refrigerators, and freezers) and products and components which become a part of that equipment. Member companies manufacture central air-conditioners and heat pumps, which are within the scope of the California regulations here in question. ARI publishes rating standards for equipment within its product scope and administers programs through which participating manufacturers may certify the operating characteristics of their products. It also publishes, semi-annually, a Directory of Certified Unitary Air-Conditioners and Heat Pumps which contains, among other data, the energy efficiency ratios (EER) of such equipment.

The Air-Conditioning and Refrigeration Institute has been duly authorized to petition on behalf of its members generally. The petitioning corporations are members of the Institute; they manufacture central air-conditioners or heat pumps or both, and are themselves subject to the California regulations in question. They are representative of such members throughout the country.

II. ACTION REQUESTED

Petitioners request the Administrator of the Federal Energy Administration to prescribe a rule under section 327(b)(1) of the Energy Policy and Conservation Act (the "act" or the "federal act") superseding the California Regulations for Appliance Efficiency Standards Relating to Refrigerators, Refrigerator-Freezers and Air-Conditioners, adopted November 3, 1976, insofar as such regulations relate to central air-conditioners and heat pumps. The regulations in question are attached as Appendix A to this petition; the portion applicable to central air-conditioners and heat pumps is Table B thereof.

III. GROUNDS FOR THE PETITION

The grounds for this petition are that:

A. The California regulations establish a minimum allowable energy efficiency ratio (EER) which must be complied with on and after November 3, 1977, in order for the equipment in question to be sold or offered for sale in California. Such a requirement differs so radically from the scheme of regulation adopted by the Congress of the United States for the same purposes that such regulations would defeat the intent of Congress as manifested in Title III, Part B of the federal act.

B. There is no significant state or local interest sufficient to justify such state regulations, and

C. Such regulations would unduly burden interstate commerce.

IV. THE FEDERAL SCHEME OF REGULATION

The federal act establishes a regulatory scheme for the purpose of conserving energy nationally, which provides a comprehensive system of cooperation between government and industry:

Section 323 of the Act provides for the development of test procedures for the measurement of energy consumption, which procedures are to be published by September 30, 1977.

Section 324 provides for the prescription by the Federal Trade Commission of labelling rules for the products in question, which will result in labels disclosing the estimated annual operating costs of such products or, in the alternative, disclosure of a "different useful measure of energy consumption (determined in accordance with test procedures prescribed under section 323)", and information as to the "range" of such operating costs or of such alternative measure of energy consumption. Such labels are to be prescribed not earlier than 45 days nor later than 60 days after the date on which test procedures are prescribed.

Section 325 provides for a system of "targets" for improvement of the aggregate energy efficiency of the covered products to the maximum extent which FEA determines is economically and technologically feasible for products manufactured in 1980. If, on the basis of reports provided for in the Act, FEA shall determine that an energy efficiency improvement target is not likely to be achieved, then FHA is directed to establish an energy efficiency standard. Pursuant to section 325(d), a standard may not take effect until a labelling rule under section 324, with respect to the type of product in question, has been in effect for at least 18 motnhs. Under the statutory schedule it would accordingly appear that a federal standard, if found necessary, could take effect as early as 1979.

The air-conditioning and refrigeration industry has been actively cooperating with FEA, the National Bureau of Standards, and the Federal Trade Commission in developing the test procedure and labelling programs; and currently such a cooperative program is getting under way with respect to procedures for tracking the industry's progress toward meeting the energy improvement targets.

Accordingly, Congress has clearly evidenced its intent that the air-conditioning industry should be given a reasonable time in which voluntarily to improve the energy efficiency of its products sufficiently to meet the national need as determined by Congress, with mandatory standards to be imposed only if the necessary improvement does not result from cooperation between government and industry. The California regulations in question are an expression of a wholly different philosophy, that is, the industry was given one year within which to meet specific and much higher, minimum standards, or else be denied the opportunity to compete in California. Moreover, as will be seen below, the differences between the two approaches are far more than merely philosophical.

The dimensions of the preemptory treatment which California proposes for this industry are indicated by Tables 1 and 2, attached as Appendix B. These tables are based upon the *ARI Directory of Certified Unitary Air-Conditioners and Unitary Heat Pumps*, which lists, as of January 1977, the capacity, power input, and energy efficiency ratio (EER) of the products indicated (broken down to show separately the models having a capacity of less than 65,000 Btuh, which is the maximum level covered by the California regulations). This shows that, as of January 1977, only 42.1% of the air-conditioners and 42.3% of the heat pumps listed could meet the EER levels provided by the California regulations. Moreover, these percentages represent the industry's products in the aggregate and, therefore, do not take into account the wide variations between particular models in respect to current efficiency. In actuality, many particular models will not be eligible for California by November 3rd of this year; and, as explained below, such gaps in a manufacturer's product line will, from a practical standpoint, prevent any of the line from being marketed in California.

Also described below is the amount of time required by the industry to redesign and bring to market new or improved products. This shows that the time allowed by the federal regulatory scheme is a minimum, and that the one year allowed in California is impracticable of attainment generally. Only a manufacturer which commenced the process well before the adoption of the California minimum standards could comply with them by November 3, 1977.

The Supreme Court of the United States has said that:

"Whether a state may constitutionally reject commodities which a federal authority has certified to be marketable depends upon whether the state's regulation 'stands as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress', *Hines v. Davidowitz*, 312 U.S. 52, 67 * * *." *Florida Avocado Growers v. Paul*, 373 U.S. 132, 141 (1963).

Petitioners submit that the California regulations here in question demonstrably "stand as an obstacle to the accomplishment and execution of the full purposes and objectives of Congress", since they would (and already are) diverting the energies and resources of the industry from the presently ongoing effort to meet the federal "targets" in a cooperation with FEA, NBS, and FTC and in a technically sound manner. These targets will, wisely, not mandate minimum levels of performance, but rather, in accordance with the statute, are being "designed to achieve the maximum improvement in energy efficiency which the Administrator determines is economically and technologically feasible to attain for each such type manufactured in calendar year 1980." (Section 325(a)(2))

This approach will encourage innovative design, for manufacturers will have reason to continually improve the energy efficiency characteristics of their products, rather than being forced to design to a specific objective. When mandated

by law specific levels of performance become both a floor and a ceiling, and thus deter innovation and improved understanding of what really constitutes technical and economic feasibility. A crash program to try to meet the California standards by November, 1977, would now distort such innovative efforts and delay rather than hasten the effective saving of energy.

The constitutional background of preemption, or supersession, is discussed in more detail in a memorandum of law which accompanies this petition.

V. THERE IS NO SIGNIFICANT STATE INTEREST TO JUSTIFY THE CALIFORNIA REGULATIONS

It is clear that California has no special interest in energy conservation different from the interest of the rest of the country. No such interest is claimed on behalf of the regulations, since (contrary to the mandate of the California statute)[1] no findings accompany the regulations. Indeed, California is relatively blessed among the states in respect to some forms of energy, so no special interest can be found in that respect. While some manufacturers of air-conditioning equipment may benefit from the exclusion of a substantial amount of their normal competition in California, consumers will be injured by the resulting limitation on their freedom of air-conditioning products, as well as by sharply increased costs, see VI–B, below. While California has, like all states, a highly legitimate interest in the conservation of energy, this interest will be adequately—and far better—served by nationwide regulation, particularly if its uniform impact is not distorted by California and other states going their separate ways.

The constitutional requirements for a special state interest sufficient to justify deviation from a federal regulatory scheme are discussed in petitioners' accompanying memorandum of law. The only indication to petitioners' knowledge, that either the California Commission or its staff considered the possibility of conflict with the federal program is found in the testimony of Marshall Johnson, presented to the California Commission on behalf of its Conservation Division, at the hearing of August 24, 1976. Copy of Mr. Johnson's testimony is attached hereto as Appendix C. As will be noted, Mr. Johnson recognizes that the federal act "establishes an extensive federal program for improving appliance efficiencies", but then states:

"Finally, the FEPCO mandates that state appliance efficiency programs should be generally compatable (sic) with the federal program. The staff of the commission has been working closely with the FEA staff in order to minimize any unnecessary differences between their program and the California program."

Mr. Johnson is in error in concluding that state programs need only be "*generally compatable* (sic) with the federal program". What the federal act requires is that any state programs should be "*identical*", in the absence of a demonstration that:

"(A) there is a substantial State or local need which is sufficient to justify such State regulation;

(B) such State regulation does not unduly burden interstate commerce; and

(C) if there is a Federal energy efficiency standard applicable to such product, such State regulation contains a more stringent energy efficiency standard than the corresponding federal standard." (sec. 327(b)(2))

California plainly cannot make the required proof; to the contrary, petitioners submit herein that precisely the reverse of requirements (A) and (B) is true; requirement (C) cannot be shown by California until a federal standard is adopted.

VI. THE CALIFORNIA REGULATIONS WILL UNDULY BURDEN INTERSTATE COMMERCE

As shown in petitioners' memorandum of law, the Supreme Court has held for a century that in areas of interstate commerce which require uniformity of treatment throughout the country the states are forbidden to act even though Congress has not acted; whereas in areas admitting of diversity of treatment the states may act until Congress so acts as to "occupy the field". Petitioners submit that the national appliance market (including, for this purpose, central residential air-conditioning equipment) plainly requires uniformity of treatment. Petitioners expect to tender to FEA, at the hearing which will presumably ensue (section 336(a) of the Act), the testimony of engineers to explain the impracticability of designing intricate equipment so as to conform

[1] Public Resources Code of California, Section 25402(c).

to varying demands of different states. Perhaps the most serious of all problems created for the industry by the California regulations is the example which they give to other states to do likewise. Attached as Appendix D is a list of the states which are already threatening proliferation of similar regulations. Some states are considering the same efficiency ratios as California but unless other states were to adopt not only the same numbers but also the same accompanying rules, regulations and interpretations, differing requirements of one sort or other throughout the country would increase, by geometric progression, the engineering and marketing difficulties already present in spades merely because of California.

Even, however, if the national appliance market were not held to require uniformity, the states could act only until Congress acted, at least in the absence of some overriding interest encompassed within the state's police power, such as health or public safety. Since, as shown above, there is no such special state interest here, the power of California to act ceased on December 22, 1975, when Congress enacted the Energy Policy and Conservation Act with a diametrically different regulatory scheme.

Petitioners submit that from the constitutional standpoint that should be the end of the matter. However, assuming that FEA agrees with petitioners on this point, it may still feel obligated by the words of the statute to determine whether the resulting burden on interstate commerce would be "undue". Petitioners believe that this can be readily demonstrated by considering the practical problems which would confront the air-conditioning industry from a marketing standpoint if the California regulations were to go into effect.

A. The Necessity of Redesigning its Products for One State Creates Severe Problems from a Marketing Standpoint

It is not sufficient from a marketing standpoint to have only scattered models eligible for California, and available for a manufacturer's California distribution; the latter will need, in order to compete, a full product line. For example, it is generally considered necessary to have a full line of "split system" air-conditioners; a full line might be considered to embrace a capacity range from 1½ to 5 tons, progressing in nominal half-ton increments. A competitive line of "single-package" air-conditioners or of single-package year-round air-conditioners. As noted above, ARI publishes twice a year a *Directory of Certified Unitary Air-Conditioners and Heat Pumps*, showing, among other data, the energy efficiency ratio (EER) of such equipment, by manufacturer. The January, 1977, directory shows substantial gaps in the lines of most manufacturers, with respect to models qualifying for California; and this is particularly true of single-package models which comprise about one-half of California's air-conditioners as compared with about 20% for the rest of the country. Moreover, it does not necessarily follow from a manufacturer's ability to redesign its 1½ ton unit for the special California level that it can do so for other models in that same product line. In any event, it takes the industry from two to three years to completely redesign a model, including its acceptance for safety purposes by independent testing agencies. Redesign of a complete product line might require 3 to 5 years. (In each case it is assumed that all equipment components, including compressors, are available at the beginning of the development program).

Each line of products within each type classification would require a separate development program. If all development programs were to be undertaken concurrently, it would be necessary that the manufacturer have financial resources, personnel and facilities to undertake the development of approximately six models in each product line simultaneously. If a manufacturer had resources to do this—and few would—approximately five years would be required to complete the programs. If, on the other hand, one model had to wait to be tested, because a test facility was already in use, then the programs would be delayed further.

B. The Additional Cost to California Consumers Discriminates also Against Out-Of-State Manufacturers

Listed below are a number of cost factors which a manufacturer must consider in the redesign of products. They apply to any manufacturer in or out of the State of California. However, manufacturers with plants in California have an inherent transportation advantage which would be enhanced in importance by the California regulations. Even a small differential in shipping costs may become crucial and deter a competitor out of the state from redesigning a product-line for a limited, specific market, thus denying the consumer a choice of products.

There are four cost factors which will directly or indirectly increase the initial cost to the California consumer:

(1) *Manufacturer's Development Cost.*—This cost will have to be defrayed over the volume sold. A unit developed for the California market exclusively will have to carry a major share of the burden.

(2) *Product Preparation Time.*—The set-up time in a manufacturing operation is added to the cost of the product. Production runs are based on volume to reduce the set-up cost per unit. The low production volumes required for one market, California, will mean added cost per unit.

(3) *Reduction of Competition.*—The added costs of developing a line of products for California will cause some manufacturer to withdraw from the market, thereby reducing competition. With fewer competitors, the cost to the consumer will be higher.

(4) *Material and Labor Cost.*—The added initial cost of a high EER, in states other than California, may be justified to the consumer by a reduction in his operating cost. Such consumer also has the opportunity to make a choice, based on economic value received, between a standard unit or high efficiency unit. However, the California consumer, with all the added costs shown above, will have an extended pay-back period. Depending on the local electrical rate, his pay-back period could well be longer than the normal expected life of the cooling or heating product.

It should be noted, with respect to the last point, that the California standards were adopted without compliance with the specific requirement of the California statute itself with respect to cost-effectiveness:

"Such standards shall be drawn so that they do not result in any added total costs to the consumer over the designed life of the appliance concerned." (California Public Resources Code, sec. 25402(c)).

CONCLUSION

Petitioners submit that the Administrator is here presented with a classic case for preemption, both under the Supremacy Clause and under the express words of the statute. Prompt action by the Administrator will discourage further proliferation of divergent state action, which may otherwise cause the air-conditioning industry still further disruption and FEA still further problems in developing its own program.

The State of California should join its effort with other states, FEA, and the industry toward final fruition of the national effort. Until it does so, the Administrator should supersede the operation of the California standard in accordance with the intent of Congress.

Respectfully submitted,

BALLARD, BEASLEY & NELSON

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APRIL 1, 1977.

APPENDIX B

FEDERAL ENERGY ADMINISTRATION,
OFFICE OF THE ASSISTANT ADMINISTRATION,
Washington, D.C.

MR. FREDERICK A. BALLARD,
Ballard, Beasley and Nelson,
Washington, D.C.

DEAR MR. BALLARD: On April 1, 1977, the Federal Energy Administration (FEA) received a petition (dated April 1) and other materials submitted by you on behalf of the Air Conditioning and Refrigeration Institute and certain individually named members of the Institute. Supplementary material you submitted, dated April 11, 1977, was received by FEA on April 12, and is considered part of the petition. The petition seeks, pursuant to section 327(b)(1) of the Energy Policy and Conservation Act (Act), supersession of a November 3, 1976, regulation of the California Energy Resources Conservation and Development Commission dealing with energy efficiency of certain appliances. The petition seeks supersession of the California regulation insofar as the regulation applies to central air conditioners, which are covered products under the Act (section 322(a)(12)), and heat pumps, which are not specifically listed as covered products under the Act, but which FEA will consider for inclusion as covered products within category (7), (12), (13), or (14) of section 322(a). The petition is deemed accepted for filing on April 1, 1977, and, on the following grounds, is denied.

Under section 327(b)(1), a petitioner is given the opportunity to demonstrate to the satisfaction of the Administrator that (A) here is no significant State or local interest sufficient to justify the State regulation at issue and (B) the State regulation unduly burdens interstate commerce. This demonstration, for which petitioner carriers the burden, requires the presentation of detailed factual information on both aspects of the statutory test. The specific type of information required is set out in section 430.43(d) and (e) of the FEA's proposed procedural regulations for supersession of State appliance efficiency standards.

These regulations were recently issued by FEA. A copy is enclosed for your information. In deciding whether the petitioner has carried the burden, the FEA is required to balance the State interest in the State regulation, if any, against the burden of that regulation, if any, on interstate commerce, as shown in the petitioner's factual presentation.

Your petition has been reviewed carefully against these standards. With respect to "significant State interest," the petition consists of a concession that California has a "highly legitimate interest" in energy conservation (page 7) and the factually unsupported statement that California is "relatively blessed . . . in respect to some forms of energy" (pages 6–7). With respect to "undue burden on interstate commerce," the petition alleges a reduction in competition and freedom of choice for California consumers (page 7), alleges a number of "practical problems" relating to increased costs and marketing problems (pages 10–12), and alleges the number of air conditioners moving interstate into California would "of course" be substantially reduced (memorandum of law, page 6). None of these allegations are supported by sufficient factual information. The data provided by petitioner (petition, pages 4–5 and 10–11, and Appendix B) are directed toward a showing of the percentage of appliances unable to meet the California energy efficiency ratio (EER) standard at this time. There is no attempt to show the level of effort (cost, administrative, or other) needed to effect compliance. This is a significant omission since, as Tables 1 and 2 of Appendix B indicate, a relatively modest increase in the EER will bring substantially complete compliance. Nor is there an attempt to document the alleged adverse marketing impact on commerce, such as the unsupported conclusory allegation of "reduction of competition" leading to "higher" consumer costs. Therefore, the FEA finds and decides that, on the ground of insufficient factual information, the petitioner has failed to carry the burden of demonstrating the FEA should prescribe a rule of supersession. Accordingly, the petition is denied.

The absence of satisfactory factual information may be explained by petitioner's reliance on the erroneous assumption that section 327(b)(1) is an expression of Congressional intent in favor of preemption, that is, of Federal occupation of the consumer appliance energy conservation field to the exclusion

of conflicting State regulations not justified by some "special" State interest. Thus, the petition argues, for example, "the power of California to act ceased . . . when Congress passed [the Act] with a diametrically different regulatory scheme" (page 9). As should be clear, the FEA cannot accept this legal argument, since it is inconsistent with a clear statutory mandate to the contrary. That mandate is found in sections 327(a) and (b). Read together, those sections make it clear that, until preemptive Federal standards are issued or the criteria in section 327(b)(1) are satisfied and rule issued, the States are allowed to enforce appliance energy use or efficiency regulations (sections 327(a) and (b)(1)). Even upon issuance of Federal standards, State regulations which would otherwise be preempted pursuant to section 327(a) shall not be superseded if the criteria in section 327(b)(2) are satisfied, including a criterion that the State standards in question be more stringent than the analogous Federal standard.

Given this statutory scheme, your assumption that Congress intended to preempt state efficiency standards prior to adoption of Federal standards is erroneous. You are thus returned to the statute and carry the burden of meeting its factual test. For the foregoing reasons, it has been decided you have failed to do so.

This decision is a final decision and action for all purposes, including judicial review. There is no administrative review or appeal. You are free, of course, to reform and resubmit your petition. If you do so, please follow the procedures contained in the enclosed regulations.

Sincerely,

MARTIN SENECA, JR.,
Acting Assistant Administrator,
Conservation and Environment.

[Appendix C entitled "Energy Conservation Program for Consumer Appliances," 10 CFR, pt. 430, appeared in the Federal Register, pp. 30206–10, June 13, 1977, and is not reprinted here.]

Senator JOHNSTON. Next we have Mr. Hudelson.

STATEMENT OF GEORGE D. HUDELSON, VICE PRESIDENT OF RESEARCH AND DIRECTOR OF ENGINEERING, CARRIER CORP.

Mr. HUDELSON. I would like to make four points on behalf of my company. First, we also support Federal preemption. We do this from the standpoint of not only a large muanfacturer who markets in all States of this country as well as worldwide, which would give us unique problems if there were individual State standards, but the same is also true for small manufacturers who may have problems above and beyond those of the large manufacturer with individual State regulations.

The second point I want to make has to do with a technicality of a minimum standard. By all means, it should be on a seasonal basis rather than at a single design point rating. In the case of the development of minimum EER's or energy efficiency ratios, it is a measure of performance or efficiency of a piece of equipment. These terms have meaning but they do not have meaning in the sense of determining estimated annual operating costs; that is, what a customer would actually experience during a seasonal operation. The law under the Energy Policy and Conservation Act requires an estimated annual operating cost be determined. If this is to have any meaning at all, then a seasonal performance characteristic must be determined. The National Bureau of Standards, as Mr. Munger has said, has worked long and hard to develop means for providing that type of information.

Senator JOHNSTON. Would that be seasonal and climatable?

Mr. HUDELSON. It takes into account hours of operation at various temperatures. You must keep in mind the efficiency consumption of an air-conditioner or a heat pump is different from that of many kinds of appliances in that it varies as a function of temperature, as a function of load, conditions which can cause it to use more or less energy depending upon the requirements of its operating circumstances.

That is where seasonal performance characteristics come into account. That should be the basis for the standards we are talking about, and the means for going from standards such as the State of California has established to a seasonal-type performance standard are at hand.

The third point I want to make is we believe the committee should give thoughtful consideration as to how minimum standards will be enforced. In the Energy Policy and Conservation Act, other than for the labeling and reporting responsibilities assigned to the Federal Trade Commission, there is no specific description covering the implementation of the testing and certification programs. This imposes considerable uncertainty on the individual manufacturers because it is difficult to assess the cost impact and the required adjustments to comply with the law.

This is a matter which requires clarification and deserves serious consideration as to levels of efficiency standards which are to be established.

As you know, our industry, through its various trade associations such as the Air Conditioning & Refrigeration Institute, AHAM, and GAMA have testing programs which have functioned well over the years. It should be observed that these programs are audited by independent testing laboratories. We recommend these programs be continued subject, as may be necessary, to periodic audits by the appropriate Federal departments.

This would seem to be more reasonable than setting up a new Government agency to perform a certification function.

The fourth point I want to make is we believe there is an oversight, an omission perhaps, in the bill as it now stands. I am talking about S. 1469. I am referring to the amendment to section 325(a) of the Energy Policy and Conservation Act where distinction is made between classes of covered products and whether they will be subject to mandatory or discretionary energy efficiency standards.

Under the current language of S. 1469, heat pumps are not included in one of the mandatory product categories. In fact, heat pumps are not specified by name. We understand they will be covered in the products listed in paragraph 14 of section 322(a) of the Energy Policy and Conservation Act.

S. 1469 states that covered products under paragraph 14 may be subject to minimum standards, but on a discretionary basis. We believe heat pumps should be included with central and room air-conditioners and furnaces under section 325(a)(1)(a) as amended. Heat pumps are one of the most important energy saving devices available today. With additional use of heat pumps, it seems only logical they should be included under the mandatory coverage of products.

Senator JOHNSTON. Thank you very much, Mr. Hudelson.

[The prepared statement of Mr. Hudelson follows:]

STATEMENT OF GEORGE D. HUDELSON, VICE PRESIDENT OF RESEARCH, AND DIRECTOR OF ENGINEERING, CARRIER CORP.

My name is George D. Hudelson. I am vice president of engineering for Carrier Corporation in Syracuse, New York and director of the corporation's research division.

I am here today to offer some comments which I hope will be helpful in your discussion of certain portions of the proposed National Energy Act and will be directed specifically to air conditioning and heating equipment. I realize the committee has a tremendous amount of information to consider, so I will keep my remarks as brief and concise as possible.

First, I should say that our corporation has more than a casual interest in your deliberations here today. Carrier is the world's largest air conditioning manufacturer. We make virtually every kind of air conditioning, forced air heating and air moving equipment, ranging from small window air conditioners to huge 10,000-ton refrigeration machines.

For the past few years, the air conditioning industry has undergone a considerable amount of turmoil for lack of a comprehensive national energy policy. As you know, a number of state and local governments have taken the initiative in proposing or adopting energy efficiency standards for air conditioning. A continuing multiplicity of state and local standards can be expected to result in massive confusion and higher costs in the marketplace.

Therefore, Carrier Corporation welcomes the prospect of minimum standards of efficiency, so long as these standards are national and pre-empt all others, whether higher or lower.

We do not feel that the pre-emption offered by the current language of the bill is sufficient. Without stronger pre-emption, manufacturers could well find themselves in the position of having to offer numerous models of the same product to meet varying state standards. This proliferation would result in sharply higher costs and, ultimately, the consumer would pay the price for this unnecessary duplication of standards.

One of the major objectives of the bill, as we understand it, is to establish a national energy policy. Without strong pre-emption, we do not believe that this can be accomplished.

The present Energy Policy and Conservation Act, Section 323 requires that test procedures be developed for the determination of estimated annual operating costs for various classes of consumer products. Determination of annual operating cost of such equipment is more accurately accomplished on a seasonal basis rather than at a single point, steady state operating condition. This is because air conditioning efficiency is affected by many variables, including such factors as the outdoor temperature, number of people inside the building and number of hours the equipment must operate to achieve the proper comfort level.

To date, where such mandatory minimum performance standards have been proposed or enacted by individual states for air conditioning and heating products, they have been expressed in steady state efficiency ratings. The use of such values will not be consistent with the intent of the federal law. Nevertheless, the levels of efficiency adopted in these state regulations, in particular by the State of California, have been based on extensive studies involving thousands of manhours of effort by state energy experts in addition to manufacturers and consultants. They include socio-economic studies as well as life-cycle cost analyses. The results of this work should not be lost in the federal program, but can in our opinion be readily translated to seasonal efficiency values for use in establishing the federal minimum performance standards.

It is Carrier Corporation's belief that efficiency standards for air conditioning and heating equipment should be established on the basis of seasonal performance characteristics. For example, in the case of a gas furnace, the steady state method of testing efficiency does not take into account the benefits which can accrue from such energy saving devices as automatic flue dampers and intermittent pilot lights. A seasonal performance standard would include the effects of such devices and thereby encourage their use. Similar examples can be shown for energy saving air conditioning equipment and heat pump designs.

Much of the work toward establishing test procedures for determining seasonal efficiency of various consumer products has already been completed by the National Bureau of Standards. Test procedures have already been prescribed for room air conditioners and proposed rules for test procedures for central air conditioners, for example, have just been published. We believe that this work

can form the basis for establishing energy efficiency standards which will achieve the purpose of the legislation under consideration today.

We believe the committee also should give thoughtful consideration to how minimum standards will be enforced. In the Energy Policy and Conservation Act, other than for the labeling and reporting responsibilities assigned to the Federal Trade Commission, there is no specific description covering the implementation of the testing and certification programs. This imposes considerable uncertainty on individual manufacturers because it is difficult to assess the cost impact and required adjustments to comply with the law. This is a matter which requires clarification and deserves serious consideration as the levels of efficiency standards are established.

As many of you know, our industry, through its trade association, the Air Conditioning and Refrigeration Institute, has an existing testing and certification program which has functioned well over a period of years. We would recommend that the ARI program be continued, subject, as may be necessary, to periodic audits by the appropriate federal department. This would seem to be far more reasonable than setting up a new government agency to perform the certification function. An appropriate period of time for adjustment of the existing industry certification procedures to the new requirements should be anticipated and allowed.

In closing, I would like to call the committee's attention to what seems to be an oversight in the bill as it now stands. I am referring to the amendment to Section 325(a) of the Energy Policy and Conservation Act, wherein a distinction is made between classes of covered products and whether they will be subject to mandatory or discretionary energy efficiency standards.

Under the current language of S. 1469 heat pumps are not included in one of the mandatory product categories. We understand that they will be covered in the products listed in paragraph 14, section 322(a), of the Energy Policy and Conservation Act. S. 1469 states that covered products under paragraph 14 are not subject to mandatory minimum standards.

We believe that heat pumps should be included along with central and room air conditioners and furnaces under Section 325(a)(1)(A), as amended. Heat pumps are one of the most important energy-saving devices available today. They can save up to 60 per cent of the electricity required for home heating. With the expected increase in usage of heat pumps, it seems logical that they should be included under the mandatory category of covered products.

Thank you for the opportunity of speaking before you here today. I would be pleased to respond to any questions you might have.

Senator JOHNSTON. Mr. Clark.

STATEMENT OF TRUMAN B. CLARK, CHAIRMAN, LEGISLATIVE COMMITTEE, GAS APPLIANCE MANUFACTURERS ASSOCIATION, INC., AND SENIOR VICE PRESIDENT, TAPPAN CO.

Mr. CLARK. We also support the fact we need a strong, meaningful preemptive provision. However this turns out, not just for minimum standards which we support, but as far as effective dates, labels, types of products, and everything else. As you know today there are several States all going in different directions. It would just be chaos with mass production to produce different products for every State.

We really need a good preemptive provision. The lead times must be realistic for the appliance manufacturer. Much of this depends on what the minimum requirements are going to be. If it is a simple minimum requirement such as eliminating pilot lights and putting on intermittent ignition devices, 6 months to 1 year, it could possibly be done because manufacturers are already well down that road.

If tighter minimum standards were legislated which then involved engineering, tooling certification, field testing and all of the other things that go with it, you can be talking about 2 or 3 years. The other part of the leadtime that needs to be considered is the fact once

the effectivity date is established to meet the new minimum standards, there needs to be a period of time to clear the inventory throughout the country from dealers or distributors or else you are just going to shut down the appliance business for a period of time until the new merchandise is available.

But there is a flow of merchandise throughout the country in the stream 2 or 3 years after you stop producing a model until you introduce a new one. They are working on the situation in California right now. We hope that law will be amended to give the dealer/distributor a year to clear his inventory.

There appears to be some overregulation particularly in the sampling procedure that FEA is proposing. The sampling procedures should be established to determine the rating on our products. We think the normal sanctions of business prohibiting fraud and deception take care of that.

The only sampling that is really needed is to verify our basic models as far as the rating for labels are concerned and for advertising. It was mentioned that we need realistic standards and how it affects the marketplace. In other words, if the standards were too tight and it doubled the price of the product, the consumer is not going to buy a new major appliance as long as the old one will operate. They are looking at say a 3-year payback on this versus the cost of energy.

The other part of this is the low-income people can be severely penalized on a gas product by eliminating gas pilots on ranges; they generally buy a gas range that has no electricity involved with it and it might be an $80 to $100 price bracket, but when you put on an electric ignition, then you will have to add $30 to $50 to the retail price and that is a substantial increase to someone in a low-income bracket versus someone who is buying a $400 or $500 range. Some thought should be given to that and California has given some thought to the low-income person and that type of product.

My last point in considering tax credits for retrofit programs on furnaces, to our knowledge it can cost almost as much to retrofit a furnace properly as it would to put in a new furnace. Furnaces do wear out. I believe if there is going to be a tax credit, it should also apply to a new furnace so they have an option to go either way.

If the furnace is 10 years old, it is only going to cost $50 or $100 more to put in a new furnace, that is what they should do. Heat exchanges do deteriorate with time and it causes an unsafe condition.

Senator JOHNSTON. Thank you very much. Let me say, speaking for myself, I am tentatively satisfied we ought to have national standards, that they ought to be preemptive. If a State wants additional standards, it ought to bear the burden of proving a local need. I am wondering: Assuming you have a situation where a State has a local need, as for example the Los Angeles Basin, the problem that comes up there is a problem that almost no one else has; can there be national standards for the kind of general class situation like the Los Angeles Basin, is that totally unique in the country or not? Can you have a national standard covering a situation where you have got high air pollution and high-cost electricity?

Mr. BAUMGART. I believe within the range of the products which we speak for, yes; national standards could provide adequately for that situation. They cannot speak for other products, automobiles,

trucks, thinks like that. I do not know enough about it, but I suspect their answer could be different.

We are talking about household——

Senator JOHNSTON. How many States want to put in the separate rules?

Mr. HUDELSON. They are in excess of 20 either already enacted or in the process.

Senator JOHNSTON. Is this because the Federal Government is so slow in acting?

Mr. HUDELSON. Yes.

Mr. CLARK. Yes.

Mr. BAUMGART. That is the central part.

Senator JOHNSTON. A California man said yesterday it is a question of experts not being able to move as fast as the grunts can move. What is responsible for that?

Mr. BAUMGART. There have been a number of delays and deadlines and delays missed in the promulgation of Federal regulations. Our people have called, over the years, the past 2 or 3 years, for more rapid processing of the issuance of regulations.

Senator JOHNSTON. Your people have?

Mr. BAUMGART. Yes.

Senator JOHNSTON. That is possible to do?

Mr. BAUMGART. We think it is possible to have the regulations issued earlier than they were and still have adequate time to prepare testimony to respond to the proposals before the finals were issued.

Senator JOHNSTON. I believe it was you, Mr. Baumgart, who said the regulations ought to be reasonable and equitable, et cetera. I don't think we can write that as legislation. I think we have to leave that to the experts to do. We have got to be fairly general and allow them some flexibility. You are not suggesting we put that in the legislation?

Mr. BAUMGART. Not beyond what it is now. What is now in the regulations, obviously you cannot ignore the laws of thermal dynamics or the laws of electricity. Also, consumers in their homes will not behave reasonably in accordance with the law unless the law itself is sound. If there is no incentive for a consumer to purchase a more efficient appliance, if it costs so much more, he is discouraged from making the initial purchase. It is that kind of economic soundness. It is mentioned in the law of 1975.

Senator JOHNSTON. For an efficient appliance you have to pay a premium. We hope they will balance that and not go to the extreme and squeeze that last kilowatthour out of the poor person at the cost of making it beyond his economic ability to buy.

Mr. BAUMGART. You have to be careful you don't penalize the low end of the market, that you do not penalize the manufacturers who produce and specialize in producing those for that part of the market.

Mr. MUNGER. You cannot write this into the law, but you rely on your experts who are in the administering agencies. They are fallible at times. I mentioned in our statement, section 336(b)(1) should provide for access to the courts if the agencies make rules that just do not seem reasonable.

In our statement, we suggest that in section 336(b)(1) following, "Any person who will be adversely affected by a rule prescribed under section 323 or 324, when it is effective," add the words "or by rule

or denial of a petition for a rule—under section 327(b) may * * * file a petition in the U.S. Court of Appeals."

We think we have been had on this FEA petition on the California issue, and we have nowhere to go. We think the addition of those words could correct the situation.

Senator JOHNSTON. We will take a look at that. We don't want to have all of these rules tied up in litigation forever, but I can understand the California situation. You need a forum, at least, for that. I do not say that as if I had made a judgment on the California situation. Frankly more California situations are going to happen as long as the Federal Government drags its feet.

Mr. MCCONNELL. Senator Johnston, one of the comments here that was made has to do with the burdensomeness of the certification requirements creeping in. One thing we would like to get at, get on with, is literally designing the new products that show improved efficiency. One of the recent occurrences has been in the enacting or promulgating of testing procedures which is an important first step. As a part of the test procedures there has been an added requirement for sampling plans, which may be the most difficult and burdensome part of the program.

There is certainly a requirement that we have a good test procedure so that everyone in the United States would follow the same test procedure, and we are finally getting there, but it has been slow. As a part of that, a seemingly unnecessary part, there has been a requirement written into the first test procedures—room air-conditioners were recently released in a final publishing—that requires, rather arbitrarily that in order for a manufacturer to even advertise his energy consumption which is the intent of their earlier law, that he had to have a 95-percent statistical certainty that the mean of the production sample be within plus or minus 5 percent.

That imposes some enormous testing burdens on the manufacturer. We already have our testing facilities tied up with development of new products. Frankly many of them are oriented toward passing or surpassing the California regulations because those are the ones in existence that are more severe.

The new requirement would require that all of our test facilities would be tied up on proving that our production is within certain tolerance limits in order to advertise the product. It only gives 90 days now in order to do all that testing and advertise the product.

It seems in light of existing certification programs which can be used and existing Federal Trade Commission enforcement capability on false advertising, these arbitrary sampling plans are totally unnecessary and impose a new burden which is literally going to bog down the whole process.

Mr. BAUMGART. I would like to build on that. What we are doing in the process of devising new test procedures and sampling plans is reinventing the wheel that already exists. We have in existence a certification program which has been mentioned. They have sampling plans, they have testing procedures built into them. They are different sometimes on a slightly different basis, but because the industry is geared to operating those programs, they are valid. They are accepted as high integrity measures.

Those programs, the test rooms, the test procedures, are in accordance with the existing program. You would have to restructure, rerate the existing devices is an unnecessary waste of time.

Mr. MUNGER. The law cannot speak to these details, therefore the administrator, the guy who tries to implement and interpret what you meant when you wrote the law, does. We have to have some recourse when he makes a misjudgment.

Senator JOHNSTON. We cannot allow the whole program to be tied up in court. We need resource, but we do not need the whole program enjoined in court. We will give some attention to that question for a forum, but a forum without injunctions that will keep the whole program tied up in court.

Mr. MUNGER. Dont forget NBS. I think they can be of help.

[The prepared statement of Mr. Clark and suggested revisions to the Energy Act follow:]

STATEMENT OF TRUMAN B. CLARK, CHAIRMAN, LEGISLATIVE COMMITTEE, GAS APPLIANCE MANUFACTURERS ASSOCIATION, INC.

Gentlemen, I am Truman B. Clark, Senior Vice President of Tappan Co. I appear today as the Chairman of the Legislative Committee of the Gas Appliance Manufacturers Association. With me are Jack Langmead, GAMA's Director of Techical Services, and Stanley Schroeder, GAMA's Director of Legislative Services. GAMA is a non-profit national trade association representing approximately three hundred (300) firms that produce in excess of 90 percent of the gas transmission and utilization equipment sold in the United States. I will limit my remarks to basic serious concerns that, unless the energy conservation program being imposed on the appliance industry reflects the manufacturing and marketplace realities, the program will waste consumers', manufacturers', and federal money, time and effort. Here are some of the main points that must be addressed and solved by the Congress.

1. PREEMPTION (EFFECTIVE) IS NECESSARY

"Energy conservation" has become a buzz-phrase in our society. State legislators feel compelled to pass, and governors to sign, almost any legislation claiming to have some energy conservation benefits. Many states now already either have enacted, or are considering enactment of legislation to ban the standing pilot light from appliances and to require the use of intermittent ignition devices. They are proceeding on this course in spite of GAMA's efforts to point out that the federal energy conservation program for appliances will require new products to save energy, and, that the use of an intermittent ignition device is expected to be one of the principal components incorporated in new appliances to achieve these savings. Understandably, the State response is, "Then why does GAMA object to States requiring intermittent ignition devices?" Our answer is this: The industry is *not* opposed to the use of intermittent ignition devices (where they are appropriate) *but* the industry cannot comply with the attendant administrative requirements which are different in each State. For example, I note with consternation (1) the development of specifications that differ among the States, (2) certification procedures that are different among the States, (3) requirements to use testing laboratories located in the State, (4) specific State labeling requirements, and (5) even different State lists as to which appliance would be required to have intermittent ignition devices.

In the same vein I note that an increasing number of States are simply banning products based on subjective decisions that they involve "non-essential uses" of natural gas. Here too the lists of products included vary among State legislative proposals and, in some cases, State agencies are given the open-ended authority to ban any other products they deem to involve a non-essential use of natural gas. What seems to be overlooked in all such legislation is that the ban of these gas-fired products will only drive the consumer to the use of similar products utilizing other energy sources which in most cases *will use more primary energy than the banned products!*

This Nation, if it is serious about energy conservation, cannot indulge itself in such seemingly patriotic but counterproductive gestures. For this reason GAMA is urging the Congress to incorporate an effective preemption provision in the appliance section that would exclude from State interference—for energy conservation purposes only—all products included in the federal energy conservation program .The House Subcommittee on Energy and Power of the House Interstate and Foreign Commerce Committee has gone part of the way in revising H.R. 6831 by providing that, if the Administrator examines and determines that minimum efficiency standards are not appropriate for a particular product category, such product category will be considered as preempted, just as if a specific minimum efficiency standard had been prescribed for that product. Our proposal for a meaningful preemption provision would not interfere with normal State police power to control the health and safety of its citizens; we ask only that where State regulation of appliance design, or right to exist, is based on energy conservation motives that such controls be preempted by the federal program of energy conservation. Unless the Congress makes such intention clear, the Energy Administrator is likely to continue to disregard the preemptive mandate of Congress as he has done under the present Law. Just two weeks ago, three petitions for preemption of California's minimum efficiency standards for appliances were denied on procedural grounds (in spite of the fact that FEA had no published procedures) without any recognition of the *serious problems* that prompted these petitions; manufacturers, large and small, simply cannot produce, sell, or distribute to a multiplicity of differing State requirements. The lack of federal backbone to preempt California will not go unnoticed by other States. Unless the Congress alleviates this burgeoning problem it will be sanctioning the destruction of the very same industry which it is directing to turn out more energy saving appliances as part of the national effort to conserve energy.

2. LEAD-TIMES MUST BE REALISTIC

The appliance industry understands the need and will make every effort to comply with the desires of the Congress to accelerate the appliance conservation program. In doing so, however, we must point out that while the time for certain steps in the regulatory process may be telescoped, others cannot. I am thinking particularly about the lead-time from the date a standard is finalized to its effective date. The House Subcommittee version includes a lead-time for this period of "no less than six months." I submit, as one who is engaged in this business, that such six-months lead-time is not realistic. Probably for most manufacturers a two-year lead-time will be required.

Suggestions have been made that there really would be a longer lead-time because "the industry would know what was coming" through advanced notice of proposed rule-making and the proposed rules themselves. These suggestions fail to recognize that the business decisions to go ahead with engineering, retooling, parts purchase, and capital commitments can only be made when the specific requirements of the new product have been defined with certainty.

At page 12 of GAM's suggested revisions (attached) we have set out the various time factors that standard drafters must include if they are sincere about having the industry achieve the standards they will be setting.

3. OVERREGULATION

(a) *Sampling Procedures.*—The temptation of administrators to incorporate every conceivable requirement in each regulation they write could slow down and distort the appliance energy conservation program. Specifically, the Federal Energy Administration is proposing to require manufacturers to use sampling procedures to *establish* the minimum efficiency ratings of their appliances. GAMA submits that gas appliance manufacturers are quite capable of establishing the rating of their products under the normal sanctions prohibiting fraud or deception. The need for a sampling plan exists only to verify that a given basic model performs as efficiently, or more efficiently, than the labeled or advertised value.

(b) *Marketplace Recognition in Standards.*—Another reality of the marketplace which must be recognized is, that if overambitious energy efficiency standards are set, that require extremely expensive appliance modifications, these standards will price these products out of the marketplace. There is no doubt that energy savings of new gas appliances over the life of the products will be substantial. But in the marketplace the consumer will be looking for a pay-back of the additional initial cost for such energy savings features in probably two to

three years. Standard setters must take this reality of the marketplace into consideration. Please note, that our statement is limited to the subject of setting standards. The industry expects fully to advertise the long-term energy savings of its more efficient appliances. We ask only that overenthusiastic standard setters not try to make us produce products the consumer will not buy.

4. NEW FURNACES—A CONSERVATION OPTION

Any serious retrofitting program for residential homes should include the option to install a new furnace or boiler that incorporates one or more of the energy-savings measures that retrofitting of an old furnace would accomplish. The consumer will be well served to be able to get comparable, if not superior, energy savings from a new furnace or boiler which (1) will be a safer product in the home, (2) will contain a new-product warranty, and (3) will be the proper size to meet the homeowners' heating needs, especially if these needs have been reduced by energy savings resulting from weather-proofing a home. Because of both the safety risks of improper retrofitting of an old furnace and the energy saving potentials of a new improved furnace or boiler we believe the public should have the option to consider the purchase of a new furnace or boiler. As the Energy Bill now reads, the new furnace option is not included in the lists of energy conservation measures that will be the basis for the residential energy tax credit or the utility programs to retrofit consumer homes, schools, and hospitals. Adequate retrofitting measures to achieve a level of energy conservation with old furnaces equal to that which will be available in new furnaces are likely to bring the costs of retrofitting very close to the cost of a new furnace so there will be no extra revenue loss by including a new furnace option. We are apprehensive, however, that unless there is a clear Congressional directive to include a new furnace option, FEA is likely to say that the Congressional list is conceptually limited to retrofitting existing old furnaces rather than replacing them.

This would pass up a ready-made opportunity to start the energy conservation ball rolling. Approximately one million furnaces in existence are being replaced each year. Each homeowner considering retrofitting in order to save energy should be afforded the option of joining this trend in order to accelerate the achievement of the national energy program. It is one of the few steps that Congress can take to get energy-saving results without a great deal of controversy.

Thank you for this opportunity to express GAMA's concerns.

SUGGESTED REVISIONS

to the
NATIONAL ENERGY ACT

supplied by the
GAS APPLIANCE MANUFACTURERS ASSOCIATION, INC.

Attached are analysis and language changes for portions of the proposed National Energy Act relevant to the needs of the gas appliance industry at this time.

SUBJECT	SECTION OF BILL	ACT	PAGE
I. STANDARDS			
Preemption is Essential	--	327	3-6
Energy Efficiency Standards to reflect:	201(a)	325	7-11
- subdivision by type or class			
- development by National Bureau of Standards			
- seasonal or steady-state efficiency			
- avoid intermediate standards			
- reasonable of achievement			
- economic considerations			
*reflected in explanation of standard			
*three-year payback			
*distortions of marketplace competition among appliances			
*energy savings of product vs. extra energy to produce it			
*"fudge factor" is dangerous			
*excessive initial cost discouraging replacement			
- technological feasibility			12
*time for redesign, retooling and production			
*availability of component parts			
*time for field testing and sampling			
*economies of scale			
*marginal cost of energy			
*product safety			

	SUBJECT	SECTION OF BILL	SECTION OF ACT	PAGE
II.	LABELING			
	Removal of All Labeling Lead Times is Unrealistic	201(c)(1)	324(d)	13
	Same Test Procedures Should Be Basis for all Requirements	201(c)(1)	324(d)	14
III.	REPORTING REQUIREMENTS			
	Third Party Aggregation	201(c)(3)	326(d)	15
	Confidentiality	201(c)(3)	--	15-16
	Procedural Safeguards	201(c)(6) & (8)	336(a)(2) & (b)(5)	17
IV.	LISTINGS OF ENERGY CONSERVATION MEASURES			
	Too Narrow			
	a.(residential buildings)	101(ii)	--	18
	b.(schools and hospitals)	301/391(2)/	--	19
	c.(residential tax credit)	1101/44B(c)(4)/		20
	d.(business tax credit)	1301(b)(3)(1)(7)		21
	Consolidation of Multiple Listings	--	328	22
V.	STATE/UTILITY RETROFITTING PROGRAMS			
	Procedures to assure industry advice	102(a)	--	23
	Access to utility financing programs	103(a)(2)(c)	--	25
	Federal direction for safety, effectiveness and installation of retrofit devices	201(b)(2)	--	26
VI.	SOLAR HUD FINANCING	111	--	28
VII.	TAX CREDITS			
	Lists too narrow and need consolidation			
	(residential)	1101	--	20
	(business)	1301	--	21
	(see IV above)			

PREEMPTION IS ESSENTIAL

When Congress undertook in 1975 to establish an "Energy Conservation Program for Consumer Products Other Than Automobiles" in Part B of Title III of the Energy Policy and Conservation Act, it envisioned a program that might involve any major type or class of product made by the household appliance industry. This same thrust is contained in the Administration proposal.

The need for preemption of state activity in carrying out this program was recognized in Section 327, but needs clarification to make certain that there is no room for misinterpretation of the intent of the Congress. The companies in this industry rely upon the economies of scale in mass production technology to hold costs down in a highly competitive marketplace. If companies are forced to make different products to differing state requirements, these economies will be lost and prices to the consumers would have to rise dramatically. If each state set its own standards and procedures this would require a multiplicity of parallel production lines in each plant which neither the large nor small companies can afford.

Even if this could be done, and it cannot, the appliance industry would be the most wasteful in the country -- multiplying its facilities while producing the same number of appliances.

A strong effective preemption provision must contain four elements:

1. Total preemption of all products of the residential appliance industry.

This includes those products for which minimum efficiency standards are scheduled, those for which minimum efficiency standards may be required by the Administrator, and all others.

This latter category will include those products which the Administrator has examined and determined that any energy savings are not of sufficient magnitude to warrant the diversion of industry resources from more productive energy saving efforts. Preemption should also extend to all other residential appliances because of the possible inclusion in the program and as a practical matter -- if they are left out they may become the victims of state pride to at least do something on their own, with all the consequences for which preemption is needed (and being given to their sister products). In short, many companies that make a variety of residential appliances will be in trouble if some of their products receive preemption but the rest are subject to multiple state standards. Their likely reaction will be to drop those product lines for which preemption is not available. Those companies making only non-preempted products would bear the full thrust of multiple state standards. To the extent they close their doors, competition within the appliance industry will be lessened to the ultimate detriment of the consumer, the Nation's productivity base and the labor force.

2. Preemption of other forms of state control based on energy saving considerations.

Some state legislatures are already considering outright bans of products they consider to be non-essential uses of natural gas. Usually, after specifically listing certain products the state legislation leaves future power to ban in the hands of some state agency. This authority is tantamount to dictatorship of the marketplace by elitist views of a handful of public servants.

Where the federal government has a program to deal with the energy conserving aspects of appliances, the states should be preempted from setting different energy conserving requirements (a ban on sale or use being the ultimate form of control). It would be a circumvention of the intent of Congress to regulate energy conservation if states would be able to ban.

3. Timely preemption from time federal program becomes law.

Because it will take some time before all aspects of the new federal program are in place, it is necessary to assure that states will not assume that they have freedom to impose their own requirements in the interim. The gas appliance industry is not capable of different quick-start requirements.

4. State has burden of appeal for exclusion from preemption.

The present law is apparently being interpreted as allowing states to proceed with their own laws and regulations unless an appeal by interested parties to have the FEA exercise its preemptive authority is acted upon by FEA. If preemption is going to work, it must be clear that unless a state petition is granted, any state activity in this area is preempted.

SUGGESTION:

To carry out these purposes it is suggested that parts of Section 327 be rewritten to clarify that the intent of Congress is for a meaningful preemption provision, as follows:

For subsections 327(a), (b) and (c) substitute the following:

Section 327(a) This part, upon enactment into law, supersedes the regulation now or hereafter, for any energy conservation related purpose, by any state or political subdivision thereof, of any covered product for which this part authorizes federal prescription of test procedures, labeling requirements, energy efficiency standards or other similar requirements with respect to energy efficiency or energy use.

(b) A state may petition the Administrator for an exemption to federal preemption provided for in Section 327(a) if it can demonstrate that--

(A) there is a compelling state or local energy conservation need sufficient to justify state regulation,

(B) such state regulation would not unduly burden interstate commerce.

(c) Within six(6) months after the date such petition is filed, the Administrator shall by rule determine whether the requirements of (b) are satisfied, taking into consideration and making appropriate findings in regard to the undue burden on interstate commerce of the following criteria--

(i) the technological and economic feasibility including anticompetitive effects on manufacturers of complying with different state and federal energy conservation regulations,

(ii) the additional cost to both the consumers within the petitioning state and those within the other states of the nation that are likely to result from increased manufacturing, sales and distribution costs of complying

with different state and federal energy conservation regulations,

(iii) the extent to which the national interest will be best served by a national uniform energy efficiency program for appliances,

(iv) the possibility of other states applying for exemption from preemption under this section.

Section 201(a)

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ENERGY EFFICIENCY STANDARDS

Subdivisions of covered products may be necessary to avoid the inequities of applying the same energy efficiency improvement requirements to different products for which the classification by type or class may fail to reflect market realities. For example, there are different types of furnaces and subcategories within these types. /Section 201(a)(1)(A) & (B)/

Because of the in-house know-how in developing the testing and sensitivity to standards requirements, the National Bureau of Standards is the logical branch of the government to develop the appliance energy efficiency standards. /Section 201(a)(1)(A)/

Classes of appliances will differ on the possibilities for efficiency improvement depending upon whether the efficiency is measured by seasonal performance or by steady-state performance. In order to maximize the net national energy savings potential, the Administrator should be able to consider either in setting an energy efficiency standard. /Section 201(a)(1)(A)(4)/

The use of intermediate standards should be avoided because they would create manufacturing uncertainties and extra product modifications that will raise capital costs and marketplace confusion. Fair, effective standards can be developed that are technologically feasible, economically justified and reasonable of achievement. This latter criterion is intended to focus the Administrator's attention on the realities of products meeting the efficiency levels expected in the time envisioned given the known production capabilities and financial operations of the various segments of the appliance industry. If a company can do better, let it be in a position to reap the marketing benefits, aided and assisted in the marketplace by labels showing comparative costs of operation as presently provided in Section 324(c)(1) of the Act /Section 201(a)(1)(A)(4)/

In order to assure that the Administrator's consideration of the various criteria listed in Section 201(a)(A)(5) regarding economic justification of a standard, be thorough, not superficial, it is suggested that these criteria be reflected in his decision to set a particular standard.

Any realistic projection of energy savings must look at the applicable background and contributory conditions that will affect the net energy improvement achievable from various energy conserving measures available. Such a systems approach should not be overlooked in setting standards. /Section 201(a)(1)(A)(5)(B)/

While the gas appliance industry should fare extremely well in any consideration of energy cost savings over the life of a product, the use of such information in setting standards could have disastrous consequences for gas appliances. If high energy cost savings over the life of gas appliances are thought to make affordable a high initial cost to meet highest possible standards, this will certainly drive consumers away from gas appliances to electric appliances--because in the realities of the marketplace, the consumer invariably focuses on initial cost, and looks for a payback in three years--not over the life of the product--even though with a gas appliance he would be saving more money and more of the Nation's energy in the long run. /Section 201(a)(1)(A)(5)(C)/

There is hard marketplace competition for the consumer's available funds or credit among the different kinds of appliances found in a typical home and between appliances using different sources of energy. In setting energy efficiency standards care should be exercised that serious market diversions are not created by standards achievable only by products that must be made so expensive that they cannot compete in the marketplace. /Section 201(a)(B)(5)(E)/

The need for the Nation to save energy should not be a justification for measures that may create a more energy efficient product but use much more energy to produce. This must be weighed by the Administrator to avoid counterproductive federal action. /Section 201(a)(B)(5)(F)/

An Administrator's "fudge factor" capability can be dangerous. If he weighs the technological feasibility, economic justifiability and reasonableness of achievement, and comes up with a minimum efficiency standard that reflects these considerations, that is what the standard should be. To allow the Administrator to interject any other factors he considers relevant will invite a repetition of the problems encountered when environmental standards attempted to be action-forcing beyond reasonable capabilities. /Section 201(a)(B)(5)(G)/

There is a very normal consumer desire to defer purchase of new appliances and to have the old ones last as long as possible. Particularly if new appliances must be priced at levels that discourage replacement, the new, more efficient appliances will not be coming into use with the result that the national effort for maximum improvement in appliance efficiency would be delayed. Reasonable standards should reflect this factor. /Section 201(a)(B)(5)(G)/

SUGGESTION:

To carry out these purposes Section 201(a) should be amended to read as follows:

PART B - ENERGY EFFICIENCY STANDARDS FOR CONSUMER PRODUCTS

Subpart 1 - Consumer Products other than Automobiles

Amendment to Energy Policy and Conservation Act

Sec. 201. (a) Section 325(a) of the Energy Policy and Conservation Act is amended to read as follows:

"(a)(1)(A) Except as otherwise provided in paragraph (3), the Administrator shall, by rule, prescribe an energy efficiency standard for each type or class or subdivisions thereof of those covered product specified in paragraphs (1), (2), (5), (6), (9), (12), and (13) of section 322(a). The National Bureau of Standards shall develop these standards.

"(B) The Administrator may, by rule, prescribe an energy efficiency standard for any type or class or subdivision thereof of the covered products of each of the types specified in paragraphs (3), (4), (7), (8), (10), (11), and (14) of section 322(a), except that the Administrator may not prescribe an energy efficiency standard for a type or class of covered product described in paragraph (14) of section 322(a) unless he determines that --

"(A)(i) average per household energy use by products of such type exceeds 150 kilowatt-hours (or its Btu equivalent) per year;

"(ii) aggregate household energy use by products of such type exceeds 4,200,000,000 kilowatt-hours per year; and

"(iii) substantial improvement in the energy efficiency of products of such type is possible.

"(2) No standard for a type (or class) of covered product shall be prescribed pursuant to paragraph (1) unless a test procedure has been prescribed pursuant to section 323 with respect to that type (or class) of product.

"(3) The Administrator shall not prescribe an energy efficiency standard for a type or class of covered product if he determines that the establishment of such standard is not technologically feasible or not economically justified.

"(4) Energy efficiency standards established pursuant to this section shall be designed to achieve the maximum improvement in energy efficiency of either seasonal or steady-state performance, whichever the Administrator deems appropriate for a particular product and which the Administrator determines is technologically feasible, and economically justified ~~and may be phased in over a period of years through the establishment of intermediate standards~~ and reasonable of achievement.

"(5) In determining whether a standard is economically justified pursuant to paragraph (3) or (4), the decision of the Administrator shall ~~consider~~ reflect--

"(A) the economic impact of the standard,

"(B) the total projected amount of energy savings included in a systems approach resulting from the analysis of the total energy consumption of typical residential structures likely to result from

the imposition of the standard,

"(C) the savings in operating costs ~~throughout the estimated average life~~ over a three-year payback period of covered products in the type of class, compared to any increase in the price of or in initial charges for, or maintenance expenses of, the covered product which is likely to result from the imposition of the standard,

"(D) any lessening of the utility or the performance of the covered product likely to result from the imposition of the standard,

"(E) any negative effects on competition likely to result from the imposition of the standard including marketplace competition between the same or other types of household products that may, or may not utilize different types of energy, and

"(F) the ~~need~~ potential of the Nation to conserve energy because the energy savings of the more efficient product will exceed the additional energy used to produce such product, and

~~"(G) any other factors he considers relevant.~~

"(G) the impact of increases in initial cost of the product so as to preclude discouraging consumers from replacing existing appliances with new more efficient ones.

Section 201(a)

TECHNOLOGICAL FEASIBILITY

A key element in determining technological feasibility, in addition to the normal consideration of whether appropriate technology will be available, is the factor of time. Without adequate consideration of the various time factors involved, an otherwise good standard can be rendered unachievable. Also, technological feasibility is often proscribed by safety limitations.

SUGGESTION:

Section 201(a) shall be amended by adding at the end thereof the following paragraph (9):

"(9) In determining whether a standard is technologically feasible pursuant to paragraphs (3) or (4) the decision of the Administrator shall reflect (but not be limited to)--

"(A) time requirements for redesign, retooling, and production,

"(B) availability of component parts and production capacity of component parts suppliers,

"(C) time requirements for field testing of new models by manufacturer, third party certification agency testing, and any sample testing required by Sec. 323(d) and Sec. 324 to substantiate advertising and labeling claims,

"(D) whether economies of scale can be achieved in time periods allowed for compliance and before a different standard is required,

"(E) design change response to the rising marginal cost of energy,

"(F) product safety.

Section 201(c)(1)

REMOVAL OF ALL LABELING LEAD TIMES IS UNREALISTIC

While Section 325(d) in the present law may look like a possible bottleneck to early effective dates (no energy efficiency standard can go into effect until a labeling standard has been in existence for at least 18 months) complete elimination of this provision would fail to consider why it is in the law. Manufacturers need lead time to meet the FTC labeling requirements.

Under the present law in Section 324(b)(5) the FTC could delay prescribing a labeling rule even up to, or past, the effective date of minimum efficiency standards. To avoid having to ship appliances without proper labels, an amendment to replace Section 325(d) would be helpful.

SUGGESTION:

"(d)(i) any labeling requirements promulgated later than six(6) months before the effective date of a standard shall extend the effective date for products to be manufactured in compliance with the standard as well as the effective date for the labeling requirement to six(6) months after the labeling rule for such requirement is finalized."

Section 201(c)(1)

SAME TEST PROCEDURE SHOULD BE BASIS FOR ALL REQUIREMENTS

The law should make it clear that labeling or advertising rules do not specify test procedures different from those required for minimum energy efficiency standards unless the initiative comes from the manufacturers involved. Normally, different test procedures would cause added expenditure of time and money that would lead to higher costs to the consumer of appliances. However, if a substantial number of manufacturers of the covered product favor use of a different test procedure to satisfy labeling or advertising requirements they should be able to have that procedure accepted by the Administrator as an alternative testing procedure.

SUGGESTION:

"(d)(ii) labeling requirements shall not specify test procedures different from those developed pursuant to Section 323 unless favored by a substantial number of the manufacturers of a covered product."

Section 201(c)(3)

CONFIDENTIALITY:
REPORTING MUST ALLOW THIRD PARTY AGGREGATION AND BUSINESS CONFIDENTIAL INFORMATION MUST BE PROTECTED

Widespread use of the Freedom of Information Act as well as the increasing inability of the federal government to guarantee the confidentiality of business sensitive information requested from the manufacturing community, make it imperative that every effort be made that only aggregate industry information be supplied to the Administrator. Most trade associations either run their own third party statistics gathering programs or contract to have this service performed. In either case the high standards of confidentiality and non-disclosure to their competing members is the sine qua non of company participation. While government solicitation of individual company advice in its standards setting role, where such information is required from each in a systematic industrywide request, the aggregating services of a third party mechanism trusted by the industry should be used.

SUGGESTION:

The proposed new Section 326(d)(sic) that would be added by Section 201(c)(3) should be amended to read--

"(d) The Administrator may require each manufacturer of covered products to submit through a third party, such as but not limited to, a trade association such aggregated information or reports with respect to energy efficiency of such covered products as the Administrator determines may be necessary to establish standards under Section 325. Each manufacturer shall retain the option to submit information directly to the Administrator."

SUGGESTION:

An additional new subsection (e) should be added to Section 326--

"(e) Where requests of the Administrator or the Commission are directed to certain specific persons for information under this Section and Section 325

which, if made public, would divulge methods or processes entitled to protection as trade secrets or other proprietary information of such persons, in accordance with the provisions of Section 1905 of Title 18 of the U.S. Code, such information, or portion thereof, when submitted in confidence to the Administrator or the Commission, shall be maintained in confidence and shall be immune from all requests for disclosure made under the Freedom of Information Act. The Administrator or the Commission, after 10 days' notice to allow argument in opposition to, or court challenge in the U.S. District Court for the District of Columbia, by the person who has supplied the confidential information, may disclose such information only upon receipt of a written pledge that its confidentiality shall be maintained to (i) any employee of the Federal Energy Administration or the Commission, if such disclosure is absolutely essential for the purpose of carrying out this chapter and (ii) upon request of its chairman, to any committee of the Congress that has a need for such information internally to carry out activities within its jurisdiction. The unnecessary or unauthorized public disclosure of such confidential information by any public servant shall be criminally prosecuted by the federal government, and shall be punishable by loss of public employment and a mandatory jail term from one to five years."

Section 201(c)(6) and (8)

FTC TYPE PROCEDURAL SAFEGUARDS SHOULD BE RETAINED FOR REPORTING REQUIREMENTS

Proposed Section 201(c)(6) and (8) should be deleted. They would remove from the present law the provisions of Sections 336(a) (2) and 336 (b)(5) which incorporate by reference Federal Trade Commission procedures for dealing with FEA informational requests in the standards development and evaluation process under the present target efficiency improvement program. The FTC procedures include the rights to cross examination, the requirement of an agency statement explaining its decisions, judicial review and the conduct of rulemaking proceedings--all of which are not covered by the provision in Section 336(a)(1) which only applies to Section 553 of Title 5, United States Code.

Similar safeguards on information and reporting will be needed in the minimum standards approach under the bill. This can be accomplished by amendment of Sections 336(a) (2) and (b)(5) to remove the reference to the target program thereby creating a reference to all of the standard associated provisions of Section 325.

SUGGESTION:

Section 336(a)(2) is amended to read as follows:

"(2) Subsections (c) and (d) of Section 18 of the Federal Trade Commission Act shall apply to rules under Section 325 ~~(other than subsections (a)(1), (2), and (3)~~ to the same extent that such subsections apply to rules under Section 18(a)(1)(B) of such Act."

Section 336(b)(5) is amended to read as follows:

"(5) Section 18(e) of the Federal Trade Commission Act shall apply to rules under Section 325 ~~(other than subsections (a)(1), (2), and (3))~~ to the same extent that it applies to rules under Section 18(a)(1)(B) of such Act.

(a) Section 101(ii) Residential Buildings
(b) Section 301 (Sec.391(2)) Schools and Hospitals
(c) Section 1101 (Sec.44B(c)(4)) Residential Energy Tax Credit
(d) Section 1301(b)(3)(1)(7) Business Energy Tax Credit

DEFINITION OF "ENERGY CONSERVATION MEASURES" -- IS TOO NARROW

Limiting energy conservation measures to those listed in the proposed Act would unnecessarily and artificially limit the energy savings options available to carry out the Nation's energy conservation effort. The list of measures must be left open-ended for the Nation to get the benefit of other energy saving measures presently available or being developed.

If a consumer's response is being sought to help achieve energy conservation, his financial contribution must be responsive to his cost/value judgement. In many cases this will mean that he will be able to purchase at comparable cost, a new furnace that contains the energy saving features he could have retrofitted onto his old furnace. From a safety point of view the factory engineered and assembled furnace avoids the risks of field retrofitting by unqualified installers -- including some venturesome homeowners. The new furnace also offers the opportunity of replacing an improperly sized furnace -- a present source of homeowner energy losses.

For these reasons these changes are suggested for various lists which appear in the Act:

a) SUGGESTION (Residential Buildings)

Section 101(11) Change proposed Definitions to read:

"(11) The term 'residential energy conservation measure' means --

* * * * *

"(B) furnace or boiler efficiency modifications not limited to--

"(i) replacement burners designed to reduce the firing rate or increase combustion efficiency to achieve a reduction in the amount of ~~fuel~~ energy consumed ~~as a result of increased combustion efficiency~~.

"(ii) devices for modifying flue openings which will increase the efficiency of the heating system, and

"(iii) electrical or mechanical ~~furnace~~ ignition systems which replace standing gas pilot lights;

"(C) clock thermostats;

* * * * *

"(E) hot water heater insulation; and

* * * * *

"(G) new furnaces or boilers incorporating one or more of the furnace efficiency modifications listed in (B), (C) or other energy conservation features; and

"(H) other new appliances that incorporate electrical or mechanical ignition systems which replace standing gas pilot lights; and

"(I) replacement of appliances that vent heated room air with those that do not, such as direct vent or rooftop units; and

"(J) other energy conserving measures approved for listing by the Administrator."

b) SUGGESTION (Schools and Hospitals):

Section 301 Change proposed section 391(2) to read:

"(2) The term 'energy conservation measure means--

* * * * *

"(F) furnace or boiler modifications not limited to

(i) replacement burners designed to reduce the firing rate or increase combustion efficiency

to achieve a reduction in the amount of ~~fuel~~ energy consumed; ~~as-a-result-of-increased combustion-efficiency...~~

* * * * *

"(J) electrical or mechanical ~~furnace~~ ignition systems which replace standing gas pilot lights, but only as part of a project which includes one or more of the energy conservation measures specified in paragraphs (A) through ~~(I)~~ (M).

"(K) new furnaces or boilers incorporating one or more of the ~~furnace~~ efficiency modifications listed in (F) and (J), paragraph (C) and other energy conservation features; and

"(L) other appliances that incorporate electrical or mechanical ignition systems which replace standing gas pilot lights; and

"(M) replacement of appliances that vent heated room air with those that do not (such as direct vent or roof top units); and

"(N) other energy conserving measures approved for listing by the Administrator."

c) SUGGESTION (Residential Energy Tax Credit):

Section 1101 Change proposed Section 44B(c)(4) to read:

"(4) Other energy conserving component.--

The term 'other energy conserving component' ~~means~~ shall include but not be limited to--

"(A) replacement burner for a furnace or boiler which

burner is designed to reduce the firing rate or increase combustion efficiency to achieve a reduction in the amount of fuel consumed ~~as a result of increased combustion efficiency~~; and

* * * * *

"(C) an electrical or mechanical ~~furnace~~ ignition system which replaces a standing gas pilot; and

* * * * *

"(G) new furnaces or boilers incorporating one or more of the energy efficiency modifications contained in (A), (B), (C) and (E) or other conservation features; and

"(H) other new appliances that incorporate electrical or mechanical ignition systems which replace standing gas pilot lights; and

"(I) other energy conserving measures approved for listing by the Administrator."

d) SUGGESTION (Business Energy Tax Credit):

Section 1301(b)(3)(1)(7) Change (7) to read as follows:

"(1) Items to be included. -- In prescribing the regulations under paragraph (1) the Secretary, in consultation with the Federal Energy Administrator, shall include, but not be limited to the following items:

* * * * *

Section 328

MULTIPLE AGENCY LISTINGS OF ENERGY CONSERVATION MEASURES IS A HARDSHIP ON SMALL APPLIANCE MANUFACTURERS AND SUPPLIERS

Few companies or trade associations have the manpower to follow the listing or delisting and accompanying procedures of their products as energy conserving measures. It would be desirable to consolidate this function in one federal agency, preferably in one listing by the energy agency being created. All other federal agencies should refer to and rely upon this listing. Because of the potential marketing consequences of such a listing, a formal rule-making procedure should be available to assure that all interested parties have an opportunity to present their views on any listing changes.

SUGGESTION:

Section 328 of PART B should be amended by adding at the end thereof:

"The Administrator shall maintain a list of residential and business energy conserving measures that would be relied upon by all federal departments and agencies for their purposes in carrying out any portion of this Act. The Administrator must make such additions or deletions in accordance with the rulemaking procedures provided for in Section 553 of the Administrative Procedure Act."

Section 102(a)

STATE/UTILITY PROGRAM RULES FOR RETROFITTING HOMES NEED FORMAL PROCEDURE FOR INDUSTRY INPUT

If anything can be learned from the experiences of the state implementation plan type approach used in environmental legislation of the early 1970's, it would be that it is essential to have early input by affected parties into the rules that the Administrator will develop under the bill to direct the activities of the regulatory agencies and utilities in the 50 states. Industry input, particularly, is needed if the Administrator's rules are expected to identify the suggested measures for residential buildings by climatic region and determine categories on the basis of type of construction or other factors such as standards for general safety and effectiveness and installation. These rules will directly affect a product's ability to compete in the marketplace because, to the state agencies, utilities and consumers in each of the 50 states, they will be the highly visible federal judgement of what is the proper thing to do to conserve energy.

Potentially, these rules of use could become as important as standards under Section 325. To guarantee affected-party a formalized input, rulemaking procedure is necessary that incorporates the benefits of advanced notice of proposed rulemaking, an opportunity for public hearing, and judicial review of the rules prescribed.

SUGGESTION:

Section 102(a) be amended to read as follows--

"Section 102(a)(1) The Administrator shall, not later than ~~120~~ 180 days after enactment of this subpart, and after consultation with the Secretary of Housing and Urban Development, ~~and~~ the heads of other agencies ~~as~~ he deems appropriate and interested parties including consensus standards-setting organizations, shall ~~promulgate rules for~~ publish in the Federal Register an advance notice of proposed rulemaking on the content and implementation of residential energy conservation plans. Not later than 60, nor less than 45 days thereafter, an agency hearing will be held at which all

interested parties may present oral or written statements.

"(2) A proposed rule on the content and implementation of residential energy conservation plans shall be prescribed not earlier than 120 days after the date of publication of advanced rulemaking.

"(3) A rule prescribing the content and implementation of residential energy conservation plans may not be published earlier than 60 days after publication of the proposed rule under this section.

"(4) Judicial review by the U.S. Court of Appeals for the District of Columbia is available for any portion of the prescribed rule by petition within 30 days after the rule is prescribed, by any interested party who can show substantial potential injury from any portion of the rule that may be arbitrary or capricious or cannot be substantiated in the public record."

Section 103(a)(2)(C)

INCLUSION OF MANUFACTURERS, DISTRIBUTORS AND DEALERS IN UTILITY FINANCING PROGRAMS

Consumer options to install energy conserving equipment may be inadvertently limited by the provisions of Section 103(a)(2)(C) which narrowly restrict utility financing programs to sales and installations made by public utilities, and one or more contractors, or a combination of public utility and one or more contractors. This would appear to exclude manufacturers, distributors or dealers who do not establish service contract relationships with the utility or purchaser even though they may normally sell and install such suggested measures. This would particularly be the case if consumers, in making their energy saving expenditure, might choose to install a new furnace incorporating multiple energy-conserving features.

SUGGESTION

Section 103(a)(2)(C) be amended to read:

"(C) make, or arrange for another lender to make, a loan to such residential customer to finance the purchase and installation costs of suggested measures purchased from ~~and~~ or installed by any of the following persons--

(i) the public utility, or
(ii) the public utility and one or more contractors, or
(iii) one or more contractors, or
(iv) manufacturers, distributors or dealers."

Section 102(b)

FEDERAL DIRECTION FOR SAFETY AND EFFECTIVENESS, AND INSTALLATION OF RETROFIT DEVICES

Section 102(b)(2), to the extent it recognizes the inherent danger of unqualified persons seeking to install retrofit measures, is to be commended. Our members would be willing to participate in the development of generic standards for the safe installation of residential energy conservation measures.

There is some uncertainty over what kind of standards the bill envisions for "general safety and effectiveness" of any suggested energy conserving measure. Present American National Standards for gas appliances and the third party certification program of the American Gas Association are designed to insure that gas appliances are manufactured to strict standards of safety and performance capability. We would welcome the legislative directive that any energy retrofit measures be required to meet similar exacting requirements. This process is already underway. Voluntary standard and certification requirements aim to prevent unsafe products from being manufactured by anyone who would only want to make a quick profit from the present homeowner's desire to conserve his energy dollars. For this reason we are uncertain that "general" safety standards would be adequate to do the job that needs to be done.

SUGGESTION:

Section 102(b) should be amended to read:

"(b) The rules prescribed pursuant to subsection (a)--

"(1) shall identify the suggested measures for residential buildings, by climatic region and by categories determined by the Administrator on the basis of type of construction or any other factors which the Administrator may deem appropriate; and

"(2) may include--

"(A) ~~standards for general safety and effectiveness of~~ requirements that any suggested measure to be used in connection with appliances be certified by an accredited third party testing laboratory as meeting

voluntary safety standards recognized by a national consensus of the complying industry;

"(B) requirements that installation of suggested methods be made in compliance with safety standards for installation of any residential energy conservation measure recognized by a national consensus of the complying industry; and

"(C) such other requirements as the Administrator may determine to be necessary to carry out this subpart."

Section 111

SOLAR ENERGY SYSTEMS SHOULD NOT EXCLUDE STANDBY PORTION OF SYSTEM IN HUD FINANCING PROGRAMS

If consumer acceptance of the solar energy program is to be given maximum encouragement HUD should finance the entire solar energy system, including the standby equipment that is an essential component of any such system, because without a standby energy source the solar system is not a viable energy system. The consumer has to purchase the total energy package.

SUGGESTION:

Section 111 amendment of Section 2(a)(3) of the National Housing Act be amended to read as follows:

"(3) the term 'solar energy system' means any addition, alteration, or improvement to an existing ~~or new~~ structure which is designed to utilize solar energy to reduce the energy requirements of that structure from other energy sources, or that portion of a new structure so designed including the standby energy equipment needed to assure all-weather service capability of the structure, and which is in conformity with such criteria and standards as shall be prescribed by the Secretary in consultation with the Administrator of the Federal Energy Administration."

GAMA
6/7/77

Senator JOHNSTON. Mr. Lane is next. As in the last panel, I would appreciate it if you would give the central thrust of your testimony in 3 minutes. Your full statement will be put in the record.

STATEMENT OF LAURENCE LANE, DIRECTOR FOR PUBLIC POLICY, AMERICAN ASSOCIATION OF HOMES FOR THE AGING, ACCOMPANIED BY THOMAS E. HERRMANN, LEGISLATIVE COUNSEL FOR PUBLIC POLICY

Mr. LANE. I am Laurence Lane, director of public policy for the American Association of Homes for the Aging. Accompanying me is Thomas E. Herrmann, our legislative counsel. We have a formal statement for insertion in the record. I will summarize.

I also would ask, Senator, if we may have an appendix to our statement, a recent report that just came out over the weekend, on total energy within nursing homes and long-term care facilities, I believe it will be helpful.

Our position is there are two deficiencies in part C as drafted in the legislation. Section 391(4)(a) does not include nonprofit, residential living arrangements, nursing homes, or homes for the aged. This exclusion has a major impact on our constituents who are nonprofit, long-term-care facilities, and homes for the aging, such as the Jewish Home in New Orleans, which I know you are familiar with. These facilities provide long-term-care services to their elderly residents, ranging from medically oriented to socially intense services. These protective services are necessary for the frail elderly person.

Many of these facilities are very old. Therefore, they need assistance to revamp their physical plants and institute energy conservation measures.

The second deficiency in the legislation is in section 391(6)(b). This section limits the grants to nonprofits organizations that are classified by the Internal Revenue Service as 501(c)(3). We feel there is need to also include organizations that are classified as 501(c)(4). Those are nonprofit organizations which are not organized for profit and are exclusively for the provision of social services. Contributions to such an organization are not tax exempt, but they are nonprofit institutions and exempt from Federal taxation.

Senator JOHNSTON. We are talking about a grant program. Should the Federal Government get in the business of making grants?

Mr. LANE. Yes; the Federal Government should make grants to nonprofit homes for the aging for undertaking energy conservation measures. There is no other way in which these facilities can get funds to initiate energy conservation measures.

Under revenue ruling 72–124, a home for the aging, in order to obtain 501(c)(3) tax-exempt status, must provide for three basic needs of elderly persons: The need for housing, the need for health care, and the need for financial security. To qualify for this classification, the facility must show a history of providing for these three primary needs. In many cases, where a new facility is constructed, it is classified by the Internal Revenue Service as 501(c)(4) for several years until it can demonstrate a continued commitment for meeting these three basic requirements. Also, housing for the elderly which is assisted through Federal programs, such as the Department of Housing and

Urban Development's section 202 program, is classified as 501(c)(4). This is due to the fact that these facilities often do not meet all three requirements, but may only offer housing and financial security for elderly persons. But in all these cases, the facility is nonprofit, is operated solely to provide services to elderly persons, and needs Federal assistance to institute energy conservation measures. The main difference between a 501(c)(3) and a 501(c)(4) organization is the percentage of strictly charitable services offered, and whether the organization is reimbursed for the services rendered.

Senator JOHNSTON. There is a substantive reason for the difference. What is the difference?

Mr. LANE. The difference is that the Internal Revenue Code differentiates in the type and structure of nonprofit organizations. A 501(c)(3) organization has to meet a certain standard and 501(c)(4) has to meet another standard. Yet they both are nonprofit.

Senator JOHNSTON. There is a substantive reason for that difference, as I recall, while it may be nonprofit itself, it contributes to the profit of the owners. In other words, you have a group of doctors who have a nursing home, maybe they don't make any money out of the nursing home but they have the facilities available to them. I cannot quote you chapter and verse, but obviously everyone would want to get the tax exemption if it was so easy to get.

Mr. LANE. An organization which is classified as 501(c)(3) by the Internal Revenue Service must be organized and operated exclusively for the promotion of social welfare. Such an organization may establish fees to recover costs in conjunction with providing social welfare or benefiting the financially distressed, but it must be not for profit. In order for a home for the aging to be tax exempt under 501(c)(4), it must establish that it is operated exclusively to promote social welfare, through betterment of the community as a whole, and not to make a profit.

Senator JOHNSTON. We want to help nursing homes, but we do not want to give Government grants that go directly into private hands. If that is the case we would want to have a guaranteed loan or something of that type.

Mr. LANE. We are speaking of more than nursing homes. A nursing home is fairly well defined in Federal law as skilled nursing facilities, intermediate care facilities. We are going one step further. We are speaking of those facilities that provide beyond nursing services; they provide social services, congregate and independent living arrangements in protected environments, as well as a wide variety of other services to the elderly.

Senator JOHNSTON. I understand. I hate to cut you off.

[The prepared statement of Mr. Lane and appendix material follow:]

STATEMENT OF LAURENCE LANE, DIRECTOR FOR PUBLIC POLICY, AMERICAN ASSOCIATION OF HOMES FOR THE AGING

Mr. Chairman, I am Laurence Lane, Director for Public Policy of the American Association of Homes for the Aging. Accompanying me this morning is Thomas E. Herrmann, who is our Legislative Counsel for Public Policy.

The American Association of Homes for the Aging represents nonprofit, community-sponsored housing, homes for the aging and health related facilities serving the elderly throughout the United States. About 250,000 older Americans

live in over 1,500 AAHA-member homes, which are sponsored by various religious, fraterial, labor, civic and county organizations. In providing a wide variety of living arrangements for elderly persons, ranging from skilled nursing to independent living, these facilities serve a vital role in communities throughout the country.

Because of our commitment toward meeting the needs of older Americans, and providing them with quality care, we are very much concerned with President Carter's proposed *Energy Conservation Program for Schools and Hospitals*, Part C of the National Energy Conservation Policy Act. While the Administration's proposal represents a good faith attempt to encourage energy conservation measures, we have serious concerns about the scope and impact of the legislation.

Specifically, the Administration's proposal excludes "a hospital furnishing primarily domiciliary care" from receiving grants for energy conservation projects. [Section 391(4)(a)]. This provision would appear to exclude all nonprofit long term care and residential facilities for the elderly from coverage under the program. This is a serious oversight which impacts most severely on these providers of services to the elderly.

Operating costs have risen astronomically for homes for the aging in recent years. The total operating costs for nursing homes rose from $7.45 billion in 1974 to $10.6 billion in 1976, a 70 percent increase. (Social Security Administration, Office of Research and Statistics, *Research and Statistics* Note #27). Much of this increase was due to the great rise in fuel prices. An example of how this situation has impacted on nonprofit homes for the aging can be taken from the experience of facilities in the Cleveland, Ohio area. During the past winter, the temperature never rose above freezing in this part of the country, with it being below zero on 42 days. In January, 1977, a home in Cleveland used 9 percent more fuel than in the previous year, yet incurred a 78 percent increase in cost. These fuel costs must be reduced. Yet, nonprofit providers of services to the elderly cannot reduce these costs without governmental assistance to finance energy conservation measures.

The future is bleak for many of these facilities and their residents. Because they are nonprofit, they do not have tax credits or profits to pay for the astronomical rise in fuel costs. Furthermore, they cannot obtain funds to pay for these increases from their residents, as these individuals are, in most cases, too poor to pay increased charges. A recent Congressional study found that 69 percent of the residents in nursing homes have an annual income under $3,000 (*Long-term Care for the Elderly and Disabled*, Congressional Budget Office, page xi). Thus, it is clear that the recent increases in fuel costs cannot be passed on to these individuals.

Nonprofit homes for the aged are in an extreme predicament, and need federal financial assistance to cope with the costly problems resulting from the energy crisis. Otherwise, some may be forced to close, and their residents displaced. In order to be exempt from federal taxation, these facilities must meet the strict requirements of the Internal Revenue Service, as articulated in Revenue Ruling 72–124. Under this ruling a home for the aged must provide for three basic needs of elderly persons in order to be tax exempt:

1. The need for housing;
2. The need for health care; and
3. The need for financial security.

It is becoming increasingly difficult for homes to adequately provide for these needs of their elderly residents, while at the same time paying for increased energy costs.

Homes for the aging were established to provide for the health and social needs of our elderly population. The average age of our member homes is 33 years, with several of our facilities being over 100 years old. When these facilities were constructed, there was little knowledge available about energy conservation techniques and materials. Since the majority of these facilities were financed with charitable donations and public funds, every effort was made to minimize costs. Furthermore, many were built at a time when there was minimal concern about our energy supply and conservation, and as a result some facilities were constructed with limited insulation, inefficient heating systems, and inadequate weatherproofing. Clearly, there is a need for initiating and implementing energy conservation measures in these facilities.

If the over 5,000 nonprofit homes for the aged in America are going to continue to provide quality care to 500,000 elderly individuals, they must receive gov-

ernmental assistance in revamping their facilities and instituting energy conservation measures. These facilities should be included in the proposed Energy Conservation Program. They want to upgrade and improve their physical plants in order to be more energy efficient. Yet, they lack an adequate financial base to do so. It is a gross oversight for a program aimed at assisting facilities which serve the nation's vulnerable population—our children and our sick—to omit nonprofit homes for the elderly. The precedent has been clearly established in the past for recognizing that homes for the aged should receive priority in any energy conservation program. In 1973, regulations were promulgated by the Federal Energy Office under the *Emergency Petroleum Allocation Act*. They included in the priority category for health ". . . clinics, hospitals and *nursing homes and other facilities (including those for the elderly)*." (Emphasis added.) (6 C.F.R. 30018, 300.19.)

We respectfully request that this Subcommittee seriously consider amending the proposed *Energy Conservation Program for Schools and Hospitals*, to include nonprofit homes for the aging in its coverage. If nonprofit homes for the aging are going to continue to provide quality care to our nation's elderly population, they must be given governmental assistance in undertaking energy conservation improvements in their physical plants. These facilities cannot continue their present operations burdened by ever-escalating fuel prices and increasingly scarce resources. If these facilities are forced to close, what will happen to their residents? From a federal budgetary perspective, it would certainly be much less costly to include homes for the aging in the Energy Conservation Program under consideration, rather than provide total governmental support for elderly persons displaced from facilities which are forced to close. As we move from a consumption-oriented society to a resource-oriented society, with a major emphasis on conservation, it is imperative that nonprofit facilities providing vital services to our elderly population be assisted through government programs. Facilities and service for the elderly cannot be ignored as we reorder our nation's priorities.

Consistent with these remarks, we respectfully suggest that the following amendment be added to Part C of the National Energy Policy Conservation Act, so that nonprofit homes for the aging, as well as their elderly residents, will be able to benefit from this legislation. The *Energy Conservation Program for Schools and Hospitals* should also include:

A facility whose stated purpose and actual effect is to provide housing and services, under competent, professional supervision, for the care or treatment of aged or disabled persons, including but not limited to skilled nursing and intermediate care facilities, residential care facilities, personal care facilities, congregate living facilities, and independent living facilities.

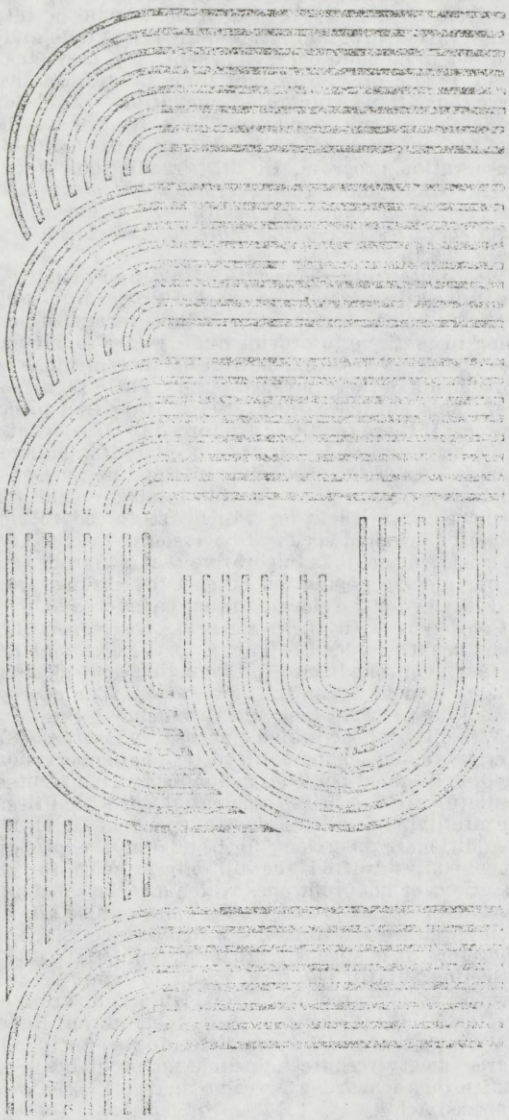
Additionally, Section 391(6)(B) of the proposed legislation should also be amended. As drafted, the bill only provides for grants to be made to public institutions or nonprofit ones which are classified as 501(c)(3) under the Internal Revenue Code. It is an oversight not to also allow the participation of nonprofit social welfare institutitons which are classified as 501(c)(4) in the program. Therefore, it is suggested that Section 391(6)(B) be amended to read:

Section 391(6) The term public or nonprofit institution means an institution owned and operated by . . . (B) an organization exempt from income tax under Section 501(c)(3) or (c)(4) of the Internal Revenue Code of 1954.

We urge that the Subcommittee, in its efforts to be responsive to the problem of scarce enegry resources, include nonprofit homes for the elderly in the class of institutions which may receive financial assistance under the provisions of this proposed Act.

We appreciate having this opportunity to appear before the Subcommittee, and will be pleased to respond to any questions that you have.

TOTAL ENERGY MANAGEMENT FOR NURSING HOMES and other long-term care institutions



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U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

IX. Guidelines For Energy Conservation

The following guidelines are provided for two different purposes.

First, they provide comprehensive information on the building systems which must be considered in the survey and the survey report.

Second, they identify specific methods which can be utilized to reduce energy consumption, information which can be especially helpful when no or limited outside expertise will be utilized. It is recognized that, in some cases, the information provided is not fully sufficient to provide the detailed instruction which may be required. In those instances other sources of information should be used. These include manufacturers, distributors and their representatives; outside consultants; utility company representatives; textbooks and other publications on the specific subject involved, and the numerous different technical periodicals which regularly carry excellent "how to" articles.

An effort has been made to make the following discussion as comprehensive as possible. As such, some of the material contained may not apply to your particular facility because the items discussed are not installed. These items should be obvious. Note that some of the discussion relates to "critical" and "noncritical" areas. Critical areas generally are considered to be those used for patient care and/or which generally are staffed on a 24-hour-per-day basis. Noncritical areas are those which usually are staffed continuously only on an eight-, ten-, or 12-hour per day basis and are used for administrative purposes, food service, laundry, and other functions.

It should be noted that the various factors discussed (e.g., ventilation and exhaust, infiltration, etc.) are listed in descending order of their potential for energy conservation.

The specific alternatives discussed are broken into two categories: MINIMAL EXPENSE and SIGNIFICANT EXPENSE. In certain cases some of the minimal expense items are preceded by a circle (◯) to indicate that they involve virtually no cost at all, and can be implemented immediately to reduce wastage of energy. Such steps would include, for example, lowering thermostats set at abnormally high levels during the heating season; being sure that lights, equipment, machinery and appliances are turned off when an area is not in use; keeping heat exchanger surfaces and filters clean; stopping leakage of conditioned air and water, steam condensate, fuel oil and gas, etc.

It must be borne in mind that the cost categorization has been supplied primarily for reference purposes. While cost is a major factor in establishing which alternatives to pursue, one also must consider the benefits involved. Moreover, cost factors vary from building to building, depending on the extent and capabilities of in-house personnel, accounting methods, and so on.

Before determining exactly which TEM options to pursue, identify those alternatives applicable to your building. Since it is unlikely that you will be able to pursue all of them during the first or even second year of your TEM program, it probably will be most effective to determine which group of alternatives—in the aggregate—will fall within budget and yield maximum benefits.

As a last note, recognize that the following discussion addresses itself primarily to components of various systems. This approach has been utilized to reduce needless repetition in that two entirely different systems may have many components in common, such as fans, motors, etc. Nonetheless, some repetition does exist where required for better understanding of material covered.

VENTILATION AND EXHAUST

Ventilation has significant impact on a building's total energy consumption. Each cubic foot of air brought into the building must be either heated or cooled and, in some cases, humidifed and/or dehumidified. It is generally agreed that many building codes demand an amount of ventilation in excess of what actually is required to provide for the safety and comfort of building occupants. Because many building code officials also recognize this, they often are willing to allow changes to ventilation systems which will drop CFM rates below those nominally required, providing that such changes are not irreversible. Of course, the approval of code authorities must be obtained before you undertake any changes which will result in violation of the applicable codes as written. Because of the nature of different activities undertaken in a nursing home, all

modifications made to the ventilation system—or any system, for that matter—must be made with extreme care. While an improper adjustment may only result in some inconvenience for those working in an administrative area, miscalculations could have serious impact in other, critical areas. For definitive information regarding rates and related information, refer to the latest version of *Minimum Requirements of Construction and Equipment for Hospital and Medical Facilities,* Publication HRA 76-4000, published by the Health Resources Administration, U.S. Department of Health, Education, and Welfare.

Note that, for the most part, the following guidelines generally are applicable only to noncritical areas. Nonetheless, some effort should be made to determine that ventilation rates and system operation in critical areas are realistic.

MINIMAL EXPENSE

a. Reduce outdoor air to the minimum required to balance the exhaust requirements and maintain a slight positive pressure to retard infiltration.
b. Inspect all outdoor air dampers. They should be as airtight as possible when closed. Check operation of position indicators for accuracy. Install, repair, or replace position indicators needed.
c. Inspect filters carefully. Create a filter replacement schedule. Utilize high-efficiency, low-cost filters.
d. Reduce exhaust air quantities as practical.
e. Close outdoor air dampers during the first and last hour of occupancy when the air must be heated or cooled, except when operating on economizer cycle, where cool outdoor air is used instead of mechanical refrigeration to meet the requirements indoors.
f. Establish a ventilation operation schedule so exhaust system operates only when it is needed most.
g. Add a warm-up cycle to air handling units with outdoor air intake in noncritical areas. Keep outdoor air dampers closed during morning building warm-up or cool-down so only air already in the building is conditioned. Cycle can be incorporated using a two-circuit time clock to control air damper and fan operation.
h. Develop guidelines or a schedule which indicates when exhaust hoods in laundries, kitchens, etc., should and should not be used. Make certain that all who utilize the hoods are familiar with and follow the guidelines and/or schedules.
i. Use exhaust hoods in food preparation and other areas only while operations are underway. Add control dampers or gravity damper to keep the air path in the exhaust duct closed when fan is not operating.
j. If a food preparation area exhaust hood is oversized, adjust it so no more air than necessary is exhausted. This can be done easily by blocking off a portion of the hood, or reducing fan speed, or lowering hood, or by utilizing a combination of these techniques in compliance with applicable health regulations.
k. Where applicable, concentrate smoking areas together so they can be served by one exhaust system.
l. Reduce volume of toilet exhausts if multiple toilet exhaust fans are installed and if total fan capacity in excess of outside air requirements. This can be done by wiring a fan interlock into toilet room lights through a timed relay, so the fan is activated only when lights are on. An administrative request plus signs to the effect that lights should be turned off when the room is not in use will help ensure that lights (and thus the fans) are off when the room is not being used. Another method involves dampering down air volume so only that amount of air required by code is removed.
m. If a large occupant load is involved, consider installing remotely adjustable outside air dampers. These permit outside air volume to be adjusted in approximate proportion to current occupancy.
n. Install baffles to prevent wind from blowing directly into an outdoor air intake.

SIGNIFICANT EXPENSE

o. Reduce or eliminate the need for using outdoor air for odor control in non critical areas by installing chemical or activated charcoal odor-absorbing devices.
p. Consider installing economizer/enthalpy controls to air handling units in non critical areas to minimize cooling energy required by using proper amounts of outdoor and return air to permit "free cooling" by outside air when possible.
q. Consider installation of heat recovery devices such as a rotary heat exchanger. (See section on waste heat reclamation systems.)

INFILTRATION

Unwanted outside air infiltrates into a building through inadvertent openings in the building envelope, open doors, etc. Since outdoor air, regardless of source, usually must be heated or cooled (and sometimes humidified and/or dehumidified), infiltration imposes a significant load on the heating and cooling systems, increasing total energy consumption. The problem of infiltration is appreciably worse in tall buildings which usually must contend with "stack effect." This occurs because of the difference in density between warm indoor air and cold outdoor air. As indoor air is heated it becomes lighter and tends to rise, eventually leaving the building through upper floors. The hot air is replaced by a continual flow of cold air entering the building through any available opening. The upflow of air increases with the height of the structure.

The following guidelines should be observed to inspect for sources of and reduce infiltration, regardless of building height or configuration.

Windows and Skylights

MINIMAL EXPENSE

a. Replace broken or cracked window panes.
b. Replace worn or broken weatherstripping around

operable windows if possible, install weatherstripping where none was installed previously.

c. Weatherstrip operable sash if crack is evident.

d. Caulk around window frames (exterior and interior) cracks are evident.

e. Rehang misaligned windows.

f. Be certain that all operable windows have sealing gaskets and cam latches that are in proper working order.

g. Consider posting a small sign next to each operable window instructing occupants not to open window while the building is being heated or cooled.

SIGNIFICANT EXPENSE

h. Install tight fitting storm windows where practical.

Doors

MINIMAL EXPENSE

a. Replace any worn or broken weatherstripping. Install weatherstripping where none has been installed previously.

b. Rehang misaligned doors.

c. Caulk around door frames.

d. Inspect all automatic door closers to ensure they are functioning properly. Consider adjustment to enable faster closing.

e. Inspect gasketing on garage and other overhead doors. Repair, replace or install as necessary.

f. Consider placing a small sign next to each door leading to the exterior or unconditioned spaces advising occupants to keep door closed at all times when not in use.

g. Consider installing signs on exterior walls near delivery doors providing instructions to delivery personnel on operation of doors.

h. Establish rules for all building personnel regarding opening and closing of doors, directing them to keep them closed whenever possible.

i. Consider installing automatic door closers on all doors leading to the exterior or unconditioned spaces.

j. If the building has a garage but does not have a garage door, consider installing one, preferably motorized to enable easier opening and closing.

k. Consider use of a card-, key- or radio frequency-operated garage door which stays closed at all times except when in use.

SIGNIFICANT EXPENSE

l. Consider making delivery entrances smaller. The smaller the opening, the more air that infiltrates when doors are open.

m. Consider using an expandable enclosure for delivery ports. It reduces infiltration when in use because it can be adjusted to meet the back of a truck reducing substantially the amount of air which otherwise would infiltrate.

n. Consider installation of an air curtain, especially in delivery areas. The device prevents penetration of unconditioned air by forcing a layer of air of predetermined thickness and velocity over the entire entrance opening. (An expert in the field should be consulted before obtaining such a device, especially when highrise structures are involved. The degree of stack effect, among other things, determines its usability.)

o. Consider installation of a vestibule for the front entrance of a building, where practical. It should be fitted with self-closing weatherstripped doors. It is critical that sufficient distance between doors is provided.

p. Consider utilizing revolving doors for the front entrance. Studies have shown that such devices allow far less air to infiltrate with each entrance or exit. Use of revolving doors in both elements of a vestibule is even more effective. If high peak traffic is involved, swinging doors can be used to supplement revolving doors.

q. In locations where strong winds occur for long durations, consider installing wind screens to protect external doors from direct blast of prevailing winds. Screens can be opaque, constructed cheaply from concrete block or can be transparent, constructed of metal framing with armored glass. Careful positioning is necessary for infiltration control.

Exterior Surfaces

MINIMAL EXPENSE

a. Caulk, gasket or otherwise weatherstrip all exterior joints, such as those between wall and foundation or wall and roof, and between wall panels.

b. Caulk, gasket or otherwise weatherstrip all openings, such as those provided for entrance of electrical conduits, piping, through-the-wall cooling and other units, outside air louvers, etc.

c. Where practical, cover all window and through-the-wall cooling units when not in use. Specially designed covers can be obtained at relatively low cost.

HEATING AND COOLING

As already mentioned, heating and cooling together usually consume the largest single "block" of energy utilized during the course of a year, in some cases accounting for more than 50% of all energy consumed. In most cases the heating/cooling system was designed only with initial costs in mind and to meet extreme conditions which possibly could occur, but which seldom do. Accordingly, many are oversized and perform in an inefficient manner.

There are many ways in which heating and cooling systems can be made more efficient. In general, these alternatives can be divided into four categories: operating practices modifications, maintenance modifications, systems modifications and control adjustment and modifications.

Operating Practices Modification (General)

Significant heating and cooling energy savings can be achieved simply by modifying the manner in which heating and cooling systems are operated. Several facts should be emphasized strongly, however:

- Operational savings are limited. While changes in operational procedures can save energy and energy costs, the net amount represents but a fraction of the potential which can be saved through other, more substantive measures. In other words, do not use operational savings as an excuse not to undertake other, potentially more beneficial measures.
- Operational savings will, in some cases, cause minor deviation from accepted standards of comfort. Some deviations may be more noticed than others.
- Professional assistance and guidance should be obtained before instituting any significant operational change. As an example, in certain situations setting a thermostat to 68F during the heating season can cause the cooling system to be activated, wasting more energy than is conserved. Likewise, setting thermostats at 78F during the cooling season can bring on heating or reheat.
- Remember that each building represents a unique situation. As such, the guidelines outlined herein should be recognized as general only. Each must be tailored for the building involved.

Here follow some of the guidelines for the more effective changes which can be made in operational routine to effect energy savings:

MINIMAL EXPENSE

(a.) Reduce use of heating and cooling systems in noncritical areas which are used infrequently or only for short periods of time.

(b.) Heat administrative areas and other noncritical spaces to 68F when occupied; to 60F when unoccupied. This does not mean that air should be cooled if the temperature exceeds 68F. Interior office spaces tend to experience significant heat gains due to lighting, equipment and people. Systems serving most areas use a combination of recirculated inside air and some outside air. As a result the temperature may tend to stay at or above 68F.

(c.) Preheat noncritical areas so they achieve 65F by the time first occupants arrive. Complete warm-up during the first hour of occupancy. Lighting, people and use of equipment will aid in warm-up.

(d.) Turn heat off during last hour of occupancy in noncritical areas. Maintain night time heat settings of 60F.

(e.) Cool noncritical areas to 78F when occupied. Do not utilize mechanical cooling when unoccupied.

(f.) Begin precooling operations so noncritical areas are at 80F, by the time occupants arrive. Complete cool-down during the first hour of occupancy.

(g.) Maintain storage areas at 60F or lower in winter.

(h.) Shut off all heating in garages, docks and platform areas.

(i.) Consider closing outside air dampers during the first and last hours of occupancy and during peak loads in noncritical areas.

(j.) Discontinue outside air preheating where practical.

(k.) During cooling season evening and night hours, flush the building with cooler outdoor air.

(l.) Allow natural humidity variations from 20% R.H. to 60% R.H. in occupied noncritical spaces.

(m.) When appropriate, consider closing supply registers and radiators and reducing thermostat settings or turning off the electric heaters in lobbies, corridors and vestibules.

(n.) Where sill-height electric heaters are used, adjust thermostat so heat provided is just sufficient to prevent cold downdrafts from reaching the floor.

(o.) Turn off humidifiers whenever a building is closed for extended periods of time, except when process, equipment, and health care requirements take precedence.

(p.) Evaluate the necessity of humidification system and curtail humidification for areas such as hallways, equipment rooms, lobbies, laundry areas, and similar spaces.

(q.) Turn off portable electric heaters and portable fans when not needed or during unoccupied periods.

(r.) Turn on self-contained units, such as window and through-the-wall units, only when needed. Turn them off when the space is to be unoccupied for several hours.

(s.) In mild weather, lower the cooling effect by running room cooling fans at lower speeds.

(t.) Turn off all noncritical exhaust fans.

(u.) Turn off reheat in all areas during summer, except where equipment and health care requirements necessitate humidity control.

(v.) When the sun is not shining during the heating season, close interior shading devices to reduce radiation from body to cold window surfaces.

(w.) Develop an after-hours equipment operation checklist for personnel who use various spaces during early and late shifts.

(x.) Schedule operating maintenance and custodial work during the daytime, if possible.

(y.) Reduce internal heat generation as much as possible during the cooling season. Typical sources include lighting, people, machines, cooking equipment, etc.

SIGNIFICANT EXPENSE

(a.) Adjust and balance system to minimize overcooling and overheating which result from poor zoning, poor distribution, improper location of controls, or improper control.

Operating Practices (Central Plant)

Once other changes have been made to affect the building's heating and cooling loads, certain changes can be made to central plant operating practices.

Some of the basic operational modifications which can be made to chillers and boilers are as follows:

(vi.) Replace worn bearings.
(vii.) Tighten belts and pulleys to eliminate excessive losses.
(viii.) Check for overheating. It could be an indication of a functional problem or lack of adequate ventilation.
(ix.) Balance three-phase power sources to motors. An imbalance can create inefficient motor operation and use more energy.
(x.) Check for overvoltage or low voltage condition on motors. Correct as necessary.

b. Engines

MINIMAL EXPENSE

(i.) Follow manufacturers recommended maintenance procedure.
(ii.) Check fuel consumption and compare with design fuel consumption.
(iii.) Record and check cooling water temperature daily. If it exceeds manufacturers recommendations, check temperatures controls and correct as necessary.

Fans and Pumps

Proper maintenance of fans and pumps can improve operational efficiency and so reduce energy consumption. The following maintenance guidelines are suggested.

a. Fans

MINIMAL EXPENSE

(i.) Check for excessive noise and vibration. Determine cause and correct as necessary.
(ii.) Keep fan blades clean.
(iii.) Inspect and lubricate bearings regularly.
(iv.) Inspect drive belts. Adjust or replace as necessary to ensure proper operation. Proper tensioning of belts is critical.
(v.) Inspect inlet and discharge screens on fans. They should be kept free of dirt and debris at all times.
(vi.) Inspect fans for normal operation.

b. Pumps.

MINIMAL EXPENSE

(i.) Check for packing wear which can cause excessive leakage. Repack to avoid excessive water wastage and shaft erosion.
(ii.) Inspect bearings and drive belts for wear and binding. Adjust, repair or replace as necessary.

Hot and Chilled Water Piping Systems

Proper maintenance of hot and chilled water piping will improve the efficiency of the piping system. Guidelines for effective maintenance of piping systems include:

MINIMAL EXPENSE

(a.) Inspect all controls. Test them for proper operation. Adjust, repair or replace as necessary.
(b.) Check flow measurement instrumentation for accuracy. Adjust, repair or replace as necessary
(c.) Inspect insulation of hot and chilled water pipes. Repair or replace as necessary. Be certain to replace any insulation damaged by water. Determine source of water leakage and correct.
(d.) Inspect strainers. Clean regularly.
(e.) Inspect heating and cooling heat exchangers. Large temperature differences may be an indication of air binding, clogged strainers or excessive amounts of scale. Determine cause of condition and correct.
f. Inspect vents. Clogged vents retard efficient air elimination and reduce efficiency of the system.

Steam Piping

Proper maintenance of steam piping will, among other things, prevent unnecessary wastage of steam. Effective maintenance procedures include.

MINIMAL EXPENSE

(a.) Inspect insulation of all mains, risers and branches, economizers and condensate receiver tanks. Repair or replace as necessary.
(b.) Check automatic temperature-control system and related control valves and accessory equipment to ensure that they are regulating the system properly in the various zones - in terms of building heating needs, not system capacity.
(c.) Inspect zone shut-off valves. All should be operable so steam going into unoccupied spaces can be shut off.
(d.) Inspect steam traps. Their failure to operate correctly can have a significant impact on the overall efficiency of the system. Several different tests can be utilized to determine operations.
  i. Listen to the trap to determine if it is opening and closing when it should be.
  ii. Feel the pipe on the downstream side of the trap. If it is excessively hot, the trap probably is passing steam. This can be caused by dirt in the trap, valve off stem, excessive steam pressure, or worn trap parts (especially valve and seats). If it is moderately hot - as hot as a hot water pipe, for example - it is passing condensate, which it should do. If it's cold, the trap is not working at all.
  iii. Check back pressure on downstream side.
  iv. Measure temperature of return lines with a surface pyrometer. Measure temperature drop across the trap. Lack of drop indicates steam blow-through. Excessive drop indicates that the trap is not passing condensate. Adjust, repair or replace all faulty traps.
(e.) Inspect all pressure-reducing and regulating valves

and related equipment. Adjust, repair or replace as necessary.

(f.) Inspect condensate tank vents. Plumes of steam on the roof are in indication of one or more defective traps. Determine which traps are defective and adjust, repair or replace as necessary.

(g.) Check accuracy of recording pressure gauges and thermometers.

(h.) Inspect pump for satisfactory operation. Look particularly for leakage at the packing glands.

(i.) Correct sluggish or uneven circulation of steam. It usually is caused by inadequate condensate drains, improper venting, inadequate piping, or faulty traps and other accessory equipment.

(j.) Correct any excessive noise which may occur in the system to provide more efficient heating and to prevent fittings from being ruptured by water hammer.

(k.) Chekc vacuum return system for leaks. Air drawn into the system causes unnecessary pump operation, induces corrosion and causes the entire system to be less efficient.

Pneumatic Air Compressor for Controls

Efficiency of pneumatic air compressors can be improved by following these guidelines:

MINIMAL EXPENSE

(a.) Inspect all connections for air leaks using a soap solution. Seal as necessary.

(b.) Note operation. If compressor seems to run excessively, it could be a sign of pressure loss at the controls or somewhere in the piping system. Determine cause and correct.

(c.) Inspect air pressure in supply tank and pressure regulator adjustment in supply line for proper limits.

(d.) Check belt tension and alignment.

(e.) Inspect air compressor intake filter pads and clean or replace as necessary.

(f.) Lubricate electric motor bearings according to manufacturer's recommendations.

General Systems Modifications

The only way to determine the efficiency of your heating/cooling system is to have the entire system tested and balanced. The extent of testing required and its cost will depend primarily on the type of system involved (and therefore no cost categorization has been included).

In all cases the survey itself should be conducted by a qualified consultant who has a thorough knowledge of heating and cooling systems, experience in testing and balancing, and the instrumentation and manpower required to collect and analyze the necessary data.

The most prevalent types of systems and steps which can be taken to make them more energy efficient are discussed as follows:

Self-Contained Systems

Energy consumption of self-contained systems, such as roof-top, window, through-the-wall and other heating and/or cooling units, can be modified as follows:

a. If multiple units are involved, consider installation of centralized automatic shut-off and manual override controls.
b. If units are relatively old, consider replacing them with more efficient air-to-air heat pumps or similar units having a higher energy efficiency ratio.

Fan Coil System

A fan coil system usually comprises several fan coil units, each of which consists of a fan and a heating and/or cooling coil. The individual units can be located either in or remote from the space or zone being served. Guidelines for reducing energy consumption of such systems include:

a. Reduce air flow to minimally satisfactory levels.
b. Balance water flows to minimally satisfactory levels.
c. When heating and cooling loads are minimal, shut off fans so the coil acts as a convector.
d. Consider installing interlocks between the heating and cooling systems of each unit to prevent simultaneous heating and cooling.

Induction Systems

Induction systems comprise an air handling unit which supplies heated or cooled primary air at high pressure to induction units located on the outside walls of each space served. The high pressure primary air is discharged within the unit through nozzles inducing room air through a cooling or heating coil in the unit. The resultant mixture of primary air and induced air is discharged to the room at a temperature dependent upon the cooling and heating load of the space. Methods for conserving energy consumed by this system include.

a. Set primary air volume to original design values when adjusting and balancing work is performed.
b. Inspect nozzles. If metal nozzles, common on most older models, are installed, determine if the orifices have become enlarged from years of cleaning. If so, chances are that the volume/pressure relationship of the system has been altered. As a result, the present volume of primary air and the appropriate nozzle pressure required must be determined. Once done, rebalance the primary air system to the new nozzle pressures and adjust individual induction units to maintain airflow temperature. Also, inspect nozzles for cleanliness. Clogged nozzles provide higher resistance to air flow, thus wasting energy.
c. Set induction heating and cooling schedules to minimally acceptable levels.
d. Reschedule the temperature of the heating/cooling water according to the load. Avoid simultaneous heating and cooling in any one zone.
e. Reduce secondary water flow during maximum

heating and cooling periods by pump throttling. For dual-pump systems, operate one pump only.

f. Consider setting of primary air temperature for heating manually, instead of relying on automatic reset by outdoor or solar controllers.
For heating noncritical areas during unoccupied hours shut down primary air fans, raise the hot water temperature and operate the induction units as gravity convectors.

Single Zone System

A zone is an area or group of areas in a building which experiences similar amounts of heat gain and heat loss. A single zone system is one which provides heating and cooling to one zone controlled by the zone thermostat. The unit may be installed within or remote from the space it serves, either with or without air distribution ductwork.

a. Implementing energy conservation measures which reduce the heating and/or cooling of air handled by the HVAC system results in reduced fan power input requirements. Fan brake horsepower varies directly with the cube of air volume. Thus, for example, a 10% reduction in air volume will permit a reduction in fan power input by about 27% of original. This modification will limit the degree to which the zone serviced can be heated or cooled as compared to current capabilities.
b. Raise supply air temperatures during the cooling season and reduce them during the heating season. This procedure reduces the amount of heating and cooling which a system must provide but limits heating and cooling capabilities.
c. Avoid simultaneous heating and cooling except as required for humidity control in critical areas.
d. Consider converting single zone, single duct systems to variable volume by adding variable volume boxes at each branch. Fan volume should preferably be controlled according to demand either by installing inlet guide vanes or by installing a variable speed motor or two speed.

Multizone System

A multizone system heats and cools several zones - each with different load requirements - from a single central unit. A thermostat in each zone controls dampers at the unit which mix the hot and cold air to meet the varying load requirements of the zone involved. Steps which can be taken to improve energy efficiency of multizone systems include:

a. Reduce hot deck temperatures and increase cold deck temperatures. While this will lower energy consumption, it also will reduce the system's heating and cooling capabilities as compared to current capabilities.
b. Consider installing demand reset controls which will regulate hot and cold deck temperatures according to demand. When properly installed, and with all hot deck or cold deck dampers partially closed, the control will reduce hot and raise cold deck temperatures progressively until one or more zone dampers is fully open.
c. Consider converting systems serving interior zones to variable volume. Conversion is performed by blocking off the hot deck, removing or disconnecting mixing dampers, and adding low pressure variable volume terminals and pressure bypass.

Constant Volume System

Constant volume systems serve to provide precise air supply at a constant volume. Opportunities for conserving energy consumed by such systems include:

a. Determine the minimum amount of airflow which is satisfactory and reset the constant volume unit accordingly.
b. Investigate the possibility of converting the system to variable (step controlled) constant volume operation by adding the necessary controls.

General

Regardless of the kind of system currently installed, consider adding portable electric baseboard unit, infrared or other types of supplemental heating units to overcome cold conditions which cannot be handled by the current system, or to heat remote or occasionally-used areas which otherwise could be heated only through activation of all or substantially all of a central system.

Distribution Systems Modifications

A distribution system comprises the equipment and materials necessary for conveying the heating and cooling media— water, steam or air. Most versions of the nine general systems previously discussed employ one or more of the following distribution systems.

Hydronic Systems

Hydronic systems are those which utilize water for transferring heating and cooling. Some of the modifications which can be made to these systems are as follows:

MINIMAL EXPENSE

a. Install insulation on all hot and chilled water pipes, fittings and valves passing through unconditioned spaces to minimize heat losses and heat gains.
b. Replace fine mesh strainer baskets with ones having the largest practical openings to reduce pressure losses.
c. Remove orifice plates not regularly used for flow measurement.
d. Balance hydronic systems to attain minimally satisfactory temperature and water flow.
e. Trim impeller to actual size required on pump curve after terminal unit flows are reduced to the minimum. This will enable reductions of power requirements of actual load.
f. Install flow measurement instrumentation where

none exists. (Factory-assembled pipe-mounted instrumentation can easily be cut into the system.)
g. Check sizing of valves, filters and pipe sections. All those which are undersized should be replaced.
h. Check all pipe fittings. Replace those which are inefficient.
i. Consider adding a parallel small-GPM pump to handle heating load for dual temperature changeover systems.
j. Consider adding a variable speed drive. Although this will conserve energy, it will limit the pump's ability to handle flow to the farthest terminal units.

Steam Systems

Steam systems are those which utilize steam as a heat source. The steam can be provided either by an on-site boiler or by district steam. Methods for modifying the steam distribution system are as follows:

MINIMAL EXPENSE

a. Install insulation on all mains, risers, and branches, economizers, water heaters, and condensate receiver tanks where none now exists.
b. Add additional shut-off valves for more efficient zone control.
c. Install recorder pressure gauges and thermometers where none now exist to enable continual monitoring of the system.
d. Modifying equipment as necessary to recover heat from condensate now going to the sewer. Such reclaimed heat can be used to heat boiler feedwater, to heat a portion of the building, to preheat water being supplied to the domestic hot water heater or being returned to the boilers.

Air Distribution Systems

Air distribution systems are those which use air for heating and/or cooling. Ways in which air distriution systems can be modified to effect energy conservation are:

MINIMAL EXPENSE

a. Test, adjust and balance entire air distribution system in accordance with methodology suggested in the 1973 ASHRAE Handbook and Product Guide.
b. Insulate all ductwork carrying conditioned air through occupied spaces with at least 1½" of fibrous insulation or its thermal equivalent.
c. Reduce system resistance to air flow to a minimum by replacing those duct sections and fittings which impose unnecessary resistance on the system; replacing dirty filters with adequately sized filter media which has high efficiency and low air flow resistance; removal of unnecessary dampers and other obstructions from ductwork and replacing high resistance inlets and outlets with modern grilles and diffusers providing low resistance.
d. Reduce Fan Power Input Requirements by Reducing Air Volume: Whenever heating and cooling loads are reduced, fan air volume reductions should be implemented to reduce fan energy consumption. Air volume can be reduced by changing the speed of rotation as follows:
   i. Where motor sheave is adjustable, open the V to reduce its effective diameter and adjust motor position or change belts to maintain power tension.
   ii. Change motor sheave if no further adjustment is possible.
   iii. If motors are variable speed, set controller for reduced speed.

Following air volume reduction, determine resulting load on the fan motor. If one full load on the motor is less than 60% of the nameplate rating, consider changing the motor to a smaller one.

SIGNIFICANT EXPENSE

e. Relocate outlets or rearrange ductwork so that air entering the space does not first come into contact with hot surfaces.
f. Consider addition of ductwork, damper and controls to permit utilization of return air in air handling systems using 100% outside air in noncritical areas.

Control Adjustment and Modifications

The controls originally installed in your building probably were specified more on the basis of initial costs than their ability to conserve energy. In addition, just five years' use without adequate maintenance—which seldom is performed—can cause controls to go out of calibration, becoming even less sensitive. A program of control adjustment and modification should consider the following guidelines:

MINIMAL EXPENSE

a. Adjust controls at the time of testing, adjusting and balancing of all heating and cooling systems.
b. Check operation of entire heating/cooling control system, including control valves and dampers. Correct all improper operations.
c. Check control system for instrument calibration and set point, actuator travel and action, and proper sequence of operation.
d. Where applicable adjust controls to prevent simultaneous heating and cooling.
e. Add controls to enable up to 100% shut-down of air and water to unoccupied space.
f. Inspect locations of thermostats. Relocate if they currently are positioned near outside walls, in areas that are seldom used, or if they are subject to outside drafts.
g. Consider installation of key-lock plastic covers over thermostats to prevent unauthorized setting adjustment.

h. Consider replacing gas pilot lights with electric ignition devices.
i. Limit the use of reheat only to areas where humidity control is needed due to equipment and/or health care requirements.
j. Install thermostats for control of all heating equipment.
k. Consider installation of night set-back and morning start-up controls which enable you to schedule heating and cooling operations for each zone on the basis of occupancy patterns. Such controls easily can save from 10% to 20% on fuel consumption. A consultant should be utilized to determine when start-up takes place to ensure comfort for occupants when they arrive for work.
l. Consider installation of program clocks and manual overall timers in control circuits to enable savings through scheduled operation of fans, refrigeration equipment, heating equipment and so on. Additional economies may result from decreased costs of labor and maintenance.
m. Consider adding an automatic draft damper control to reduce heat loss through breaching when the gas or oil burner is not in operation.
n. Consider adding time clocks on self-contained heating and cooling units in noncritical areas for automatic shut-off.
o. Consider adding a step-controller to electric heating systems with resistance elements to permit staging. This results in more effective heat control and demand management.
p. Consider addition of manual or automatic control valves to steam radiators to permit total shutdown in noncritical areas during unoccupied periods and partial shutdown to eliminate overheating.

TRANSMISSION

Transmission losses generally can be reduced either through modification of glazing characteristics or addition of insulation.

Glazing

In all cases, preferential treatment should be given to those windows most exposed to direct sunlight or high levels of reflected sunlight.

MINIMAL EXPENSE

a. Inspect condition of indoor shading devices such as drapes and blinds which can reduce heat gain as much as 50%. Keep indoor shading devices clean and in good repair.
b. During the heating season, close all interior shading devices at night to reduce heat losses.
c. Use opaque or translucent insulating materials to block off and thermally seal all unused windows.

SIGNIFICANT EXPENSE

d. Consider adding reflective and/or heat-absorbing film to glazing to reduce solar heat gains by as much as 80%. Be aware that such films will substantially reduce the benefits of natural lighting and solar heat gain in winter.
e. Consider adding reflective materials to the window side of draperies to reflect solar heat when draperies are drawn.
f. Install indoor shading devices where none now exists, even if exterior shading devices are used. They should be light-colored and opaque.
g. Consider installation of outdoor shading devices, such as sunshades, which reflect solar heat before it has a chance to enter the building. Adjustable sunshades enable entrance of warming rays during the heating season.
h. Consider installation of storm windows if practical.
i. Consider reglazing with double or triple-glazing, or with heat absorbing and/or reflective glazing materials.

Insulation

It is advised strongly that expert technical assistance be obtained before undertaking any insulating. This will help ensure that the proper type and correct amount are installed, that cost effectiveness will result, and that any potential problems—such as moisture condensation—can be avoided.

MINIMAL EXPENSE

a. Where roof insulation is not practical, consider insulating the top floor ceiling. This can be done easily with blown insulation. In most cases, ceiling insulation also will require a vapor barrier placed on the warm side of the ceiling—if not integral with the insulation—to prevent structural damage caused by rot, corrosion or expansion of freezing water.
b. If remodeling or modernization is contemplated, consider adding insulation to all exterior walls as well as those which separate conditioned and nonconditioned spaces. Refer to ASHRAE Standard 90-75 for insulation guidelines.
c. Add or improve insulation under floors over garages or other unconditioned areas. Refer to ASHRAE Standard 90-75 for insulation guidelines.

Exterior Surfaces

MINIMAL EXPENSE

a. Repaint or clean exterior wall finish to improve reflective characteristics.
b. Repaint or resurface roof to make it more reflective.

LIGHTING

Because the lighting systems of many existing nursing homes were designed within the restrictions of initial cost economies, without knowledge about final space use and subdivision, and without benefit of relatively recent developments and research findings in the field, there exists significant potential for lighting

system modification. These modifications can reduce substantially the energy consumed by the lighting system (and associated costs) while still providing occupants with the quality and quantity of illumination required to perform their various tasks and functions.

Before undertaking any change, you must recognize that a lighting system is just that—a system. Its many elements all are interrelated with one another, just as the lighting system is interrelated with other systems in the building. While energy can be conserved by properly removing lamps and luminaires, realize that such action should be taken only after the entire system has been analyzed and all options evaluated. Conservation of energy is important, but it must be achieved in a manner consistent with other requirements, including those of productivity and visual comfort, aesthetics, Federal, State and local codes and ordinances, etc. Moreover, it is especially important to recognize that major alterations to a lighting system can have a significant impact on heating and cooling systems, most of which were designed to consider the amount of heat given off by the lighting system as originally designed. For these reasons, it is suggested strongly that competent technical assistance be obtained before any significant modifications are made and that modifications be made only in terms of the building's illumination needs, the lighting system which currently exists, and the many different options which can be utilized.

The following discussion highlights many of the actions which should or can be taken to implement an effective program of lighting energy management.

Modify Usage Patterns

An excellent initial step for a program of lighting management is to modify usage patterns based on factors developed during the building survey and utilizing the form shown in Appendix A. It should be noted that steps such as developing an effective lighting usage program would have to be updated and modified as changes are made to the lighting system but, for the most part, such modifications should be relatively simple once the initial steps have been undertaken.

MINIMAL EXPENSE

(a.) Establish an effective lighting usage program; a planned program to turn lights on when and where they are needed. The major advantages of such programs are that they can be tailored to the individual characteristics of the space and needs of its occupants, and can be implemented relatively inexpensively and quickly. The key element of a lighting usage program is a lighting schedule related to occupant usage patterns. Personnel should be assigned, trained and made responsible for the efficient utilization of lighting by means of established schedules for the control of lighting.

Define the exact nature of occupancy for each period of time. Determine the amount of lighting needed for safety and security purposes. Provide detailed instructions for system operation to responsible employees by means of charts, posting and/or [illegible]ng of switches. Train the responsible employees to assure understanding and compliance with the procedures.

The following two options should be considered part of the overall program.

- Campaign for better utilization by using letters, memos, signs and personal contact to encourage occupants to use lighting only when it is needed, to use only the amount of lighting required, and to turn off lights whenever they are not being used.
- Post a small sign or chart near each control panel which identifies which lights are controlled by individual circuit breakers. This enables the user to be more selective while also reducing trial-and-error which can consume significant amounts of energy as banks of lights are quickly activated and deactivated.

Work Station Modifications

Work stations can be relocated to take maximum advantage of the lighting system which exists or to supplement or enable changes to other elements of the system. Typical modifications to work station locations are as follows:

MINIMAL EXPENSE

(a.) Move desks and other work surfaces to a position and orientation that will use installed luminaires to their greatest advantage (instead of moving luminaires).

(b.) To the extent permitted by productivity requirements and related concerns, group tasks which require approximately the same levels of illumination and provide an opportunity to reduce the total amount of lighting needed.

(c.) Locate work stations requiring the highest illumination levels nearest the windows. Recognize that utilization of natural lighting will have an impact on heat gain, therefore requiring that the heat gain, light gain trade-off be given careful consideration. In many cases glazing can be modified to limit heat gain while still permitting entry of a significant amount of light. (Such modifications are discussed earlier in this chapter under "Transmission, Glazing.") To reduce glare rearrange work surfaces so that sidewall daylighting crosses the task perpendicular to the line of vision.

Maintenance Considerations

Proper maintenance of lighting system components serves to keep the system running at peak efficiency. This not only conserves energy and energy costs, but also helps maintain quality illumination and extends lamp and luminaire life. The following maintenance considerations should be reviewed.

MINIMAL EXPENSE

(a.) Lamp efficiency deteriorates over the life of a lamp. Light output should be checked regularly with a calibrated light meter by maintenance personnel.

When the light output of a group of lamps has fallen to approximately 70% of the original light output, relamp all fixtures in the group at the same time. This is also a good time to check whether a more efficient or lower wattage lamp is suitable.

b. Lamps should be wiped clean at regular intervals to assure maximum efficiency. Lamps which are exposed to an atmosphere with substantial amounts of dirt, dust, grease or other contaminants should be cleaned more frequently than lamps in a relatively clean atmosphere.

c. Luminaire efficiency can be maintained by properly cleaning the reflecting surfaces and shielding media. Replace lens shielding that has yellowed or become hazy. Use a clear acrylic lens with good nonyellowing properties. For some applications, a clear glass lens can be considered if it is compatible with the luminaire and does not present a safety hazard. (Caution should be used to assure that an existing luminaire will safely support and hold the glass lens.)

d. Clean ceilings, walls and floors frequently to improve reflective qualities. When daylight is used, wash windows frequently to maintain illumination levels.

Illumination Level Modification

In many cases the existing lighting system provides more illumination than necessary to carry out a particular type of task. For this reason it is suggested that the building survey include measurement of existing illumination levels through use of a properly calibrated lightmeter. Recommended illumination levels for various types of spaces are shown in Figure VI-1.

Figure VI-1: Suggested Illumination Levels

Area	Footcandles on Tasks
Nursing homes	
Corridors and interior ramps	20
Stairways other than exits	30
Exit stairways and landings, on floor	5
Doorways	10
Administrative and lobby areas, day	50
Administrative and loby areas, night	20
Chapel or quiet area, general	5
Chapel or quiet area, local for reading	30
Physical therapy	20
Occupational therapy	30
Work table, course work	100
Work table, fine work	200
Recreation area	50
Dining area	30
Patient care unit (or room), general	20
Patient care room, reading	30
Nurse's station, general	
Day	50
Night	20
Nurse's desk, for charts and records	70
Nurse's medicine cabinet	100
Utility room, general	20
Utility room, work counter	50
Pharmacy area, general	30
Pharmacy, compounding, and dispensing area	100
Janitor's closet	15
Toilet and bathing facilities	30
Barber and beautician areas	50

Source: Illuminating Engineering Society

Methods for adjusting the illumination [illegible] given space, and for maintaining or raising [illegible] while still reducing energy requirements, are discussed below.

MINIMAL EXPENSE

a. Remove unnecessary lamps if removal will still enable provision of illumination levels required. When lamps are removed from a fluorescent luminaire, all lamps controlled by a given ballast should be removed to prevent ballast failure or reduced lamp life. Except in the case of instant start lamps or luminaires with circuit-interrupting lampholders, also consider disconnecting ballasts which otherwise would continue to consume energy.

b. Consider replacing present lamps with those of lower wattage which provide the same amount of illumination or (if acceptable in light of tasks involved) a lower level of illumination. (Lens changes or lowering the luminaire often can help facilitate this option). This method is particularly applicable where current lighting levels are higher than recommended or where uniform lighting is the most practical due to occupant density, as discussed above. This also is a simple way to provide flexibility should higher levels of illumination be required at some future time. (Note: Be certain that new lamps are compatible for use with existing ballasts in fluorescent and H.I.D. (High Intensity Discharge) luminaires.)

c. Select lamps which are the most efficient (efficiency is measured in lumens per watt) and which are compatible with the application. Compatibility with the luminaire, of course, also is essential. If some luminaire replacement is to be undertaken, therefore, determination of lamp type involved also should be considered.

Lamp Modification

Lamp modification can take many forms. In some cases it may involve elimination of lamps; using those of lower wattages; changing the type involved (which may imply a change of luminaire), etc. Consider the following guidelines.

In general, efficacies (lumens/watt) of lamp types rank as follows, in descending order:

Lumens Per Watt (Including Ballast)

	Smaller sizes	Middle sizes	Larger sizes
High pressure sodium	84	105	126
Metal halide	67	75	93
Fluorescent	66	74	70
Mercury	44	51	57
Incandescent	17	22	24

This ranking, of course, is general only. There is overlapping of efficacies between lamp types and even within a lamp type, for different wattages, life ratings, etc. Selection of the most efficient lamp must be evaluated on the basis of the specific application and the

performance characteristics of the individual lamps being considered. Changing from incandescent to a more efficient light source can give paybacks in as little as one to two years depending upon local costs of energy.

d. Use a single, larger incandescent lamp where possible, rather than two or more smaller lamps. Higher wattage general service incandescent lamps are more efficient than lower wattage lamps.
e. Avoid multi-level lamps. The efficiency of a single wattage lamp is higher per watt than a multi-level lamp.
f. Avoid using extended service lamps except in special cases, such as recessed directional lights, where short lamp life is a problem.
g. When relamping, replace 40-watt fluorescent lamps with 35-watt lamps to achieve a reduction in lighting level of approximately 18%, while saving 20% in fixture electrical energy.

Luminaire Modifications

Some of the modifications to luminaires which are possible include the following.

SIGNIFICANT EXPENSE

a. If relocation of work station is impractical, relocate luminaires to provide light on task areas at an angle outside the zone which causes veiling reflections.
b. Replace outdated or damaged luminaires with modern luminaires which have good cleaning characteristics and which use lamps with higher efficacies and better lumen maintenance characteristics.
c. Consider installing fluorescent luminaires with multiple level ballasts or adding dimming controls for incandescent luminaires in multiple-purpose spaces which require more than one level of illumination.
d. Consider lowering luminaires so they will provide recommended illumination levels on the task area at reduced wattage.
e. Where appropriate, consider installation of lenses which provide special light distribution patterns to increase lighting effectiveness. As examples, linear batwing, radial batwing, parabolic louvers or polarizing lenses may provide better visibility with the same or even reduced wattage. It is suggested that competent technical advice be obtained to evaluate where such lenses can be used most effectively.
f. Replace all incandescent parking lighting with HID lamps (mercury vapor, metal halide, or high or low pressure sodium).

Control Modifications

In many cases modification of existing lighting controls, and addition of new ones, can have a considerable effect on energy consumption. Consider the following guidelines.

MINIMAL EXPENSE

a. When existing circuitry makes it impossible to utilize less than 25% of the light in a large space whenever light is needed, and when persons work during normally unoccupied periods, consider development of a desk lamp issuance program which enables persons working during unoccupied periods to use a simple desk lamp or two instead of a large bank of luminaires.
b. When natural light is available in a building, consider the use of photocell switching to turn off banks of lighting in areas where the natural light is sufficient for the task.
c. Consider using photocell and/or time clock controls for that outdoor lighting required for only a part of the period of darkness, (safety or security, requirements permitting.) Such lighting would be turned off automatically during late evening and early morning hours.
d. Consider using time controls for those areas of a building which are used infrequently and then only for brief periods. These controls turn off lights automatically after being activated for a set period of time.
e. Consider using alternate switching or dimmer controls when spaces are used for multiple purposes and require different amounts of illumination for the various activities. It is possible to provide multiple levels by providing switching for alternate fixtures, alternate sets of lamps in fluorescent fixtures, etc. Dimmer controls can be effective when it is impractical to use selective switching to obtain multiple lighting levels. This is especially true (and relatively low in cost) when incandescent lighting is involved.

SIGNIFICANT EXPENSE

f. Provide selective switching. Initial cost economies and lack of knowledge about final space subdivision often lead to the use of central panel-boards as the only means of controlling large blocks of lighting. This design approach precludes the potential for turning on only the amount of lighting that is actually needed after the space has been subdivided. Investigate ways to provide local control of lighting. Localized switches can be provided near doorways. Remotely controlled switches can be located near panelboards to control groups of lights. Low voltage control circuits can be used to provide local control of switches located in remote locations (these controls usually are relatively inexpensive). When properly used, localized switching usually will save enough energy to provide a pay-back on the investment within a short period of time.
g. Lighting use in remote areas can be monitored by providing neon indicator lights at central stations. Personnel will be alerted to investigate and turn off lights not being used.

Heat of Light Recovery Systems

SIGNIFICANT EXPENSE

Heat of light recovery systems—because of the expense they entail—usually are feasible only if dernization programs are involved. While many different types are available, most provide the same basic functions. In essence, the heat produced by lighting is extracted by mechanical equipment through a ceiling cavity to the mechanical equipment room. The heat collected can be recycled to reduce heating energy needs in cold weather or exhausted to reduce the cooling energy needs during warmer weather. Removal of heat in this manner usually enables luminaries and lamps to operate more efficiently and also may reduce fan horsepower requirements of the air circulation system.

DOMESTIC HOT AND COLD WATER

Domestic hot water may account for from 2% to 4% or more of the total energy consumed in your facility. Chilled water provided in drinking fountains also is a factor in total energy consumption. The following guidelines should be considered in an effort to conserve energy:

MINIMAL EXPENSE

(a.) Inspect water supply system. Repair all leaks, including those at the faucets.

b. Inspect and test hot water controls. If they are not working properly, regulate, repair or replace.

c. Inspect insulation on storage tanks and piping. Repair or replace as needed.

d. Increase the amount of insulation installed on hot water pipes and storage tanks or replace existing insulation with a type having better thermal properties ("R" value).

e. Consider replacing existing hot water faucets with spray type faucets with flow restrictors where practical.

f. Consider installing spring-activated hot water taps.

g. If water pressure exceeds 40 to 50 pounds, consider having a plumber install a pressure reducing valve on the main service to restrict the amount of hot water that flows from the tap.

h. Reduce generating and storage temperature levels to the minimum required for washing hands, usually about 110F. Boost hot water temperature locally for kitchens and other areas where it is needed, rather than providing higher than necessary temperatures for the entire building.

i. If an electric domestic water heater is installed, consider limiting the duty cycle to avoid adding water heating load to the building during period of peak electrical demand.

j. Disconnect all refrigerated water fountains if acceptable to building occupants, including residents.

k. Discontinue sterilization of drinking water where possible, practical, and permissable.

l. Consider relocating the water heater as close to the point of use as possible. The longer the run, the more hot water that sits in it—cooling down between periods when hot water is drawn.

m. Consider replacing free running drinking fountains with spigot types which utilize a paper cup. Up to half the water drawn by free-running fountains is wasted.

SERVICE FACILITIES

Service Facilities include laundries, kitchens and cafeterias. In each case, a variety of different modifications can be made which will help reduce energy consumption.

Laundries

Some long-term care institutions have in-house laundries which consume a substantial amount of energy. The following guidelines indicate some of the steps which can be taken to reduce this consumption.

MINIMAL EXPENSE

(a.) Develop concise operating procedures for each piece of equipment. Place instructions on or very near the equipment.

(b.) Wash and dry full loads only.

(c.) Iron only those items which require it.

(d.) Remove items from the dryer immediately after the drying cycle is complete to prevent wrinkling. This reduces the energy which otherwise would be required for ironing.

(e.) Use heated water in the wash cycle only, set at the minimally-acceptable temperature.

(f.) Instruct workers to keep lint filters in dryers and exhaust hoods clean. Perform spot checks to ensure compliance.

(g.) Operate exhaust systems installed over washers, flatwork ironers, tumblers, etc., only when needed. Check periodically for improper operation and repair promptly as necessary.

h. Repair, replace or install insulation to equipment to reduce heat gains in the room. Contact equipment manufacturers for information on insulation qualities.

(i.) Consider rescheduling laundry work hours to avoid periods when the hospital experiences its peak electrical and/or steam demand.

j. Consider installing a time clock for automatic shut down of hot water generator.

SIGNIFICANT EXPENSE

k. Investigate applicability of heat reclamation devices (see section on waste heat and reclamation systems.)

Kitchens and Cafeterias

A variety of steps can be taken to effect more efficient use of energy in kitchen, cafeteria and other food-handling areas:

MINIMAL EXPENSE

(a.) Turn off infrared food warmers when no food is being warmed.
(b.) Inspect refrigeration condensers routinely to ensure that they have sufficient air circulation and that dust is cleaned off coils.
(c.) Inspect and repair walk-in or reach-in refrigerated area doors without automatic closers or tight gaskets.
(d.) Train employees in conservation of hot water. Supervise their performance and provide additional instruction and supervision as necessary.
(e.) Avoid using fresh hot or warm water for dish scraping.
(f.) Keep refrigeration coils free of frost build-up.
(g.) Clean and maintain refrigeration on water chillers and cold drink dispensers.
(h.) Reduce temperature or turn off frying tables and coffee urns during off-peak periods.
(i.) Preheat ovens only for baked goods. Discourage preheating any sooner than necessary.
(j.) Refrigerator and freezer doors should be kept open only as long as necessary.
(k.) Run the dishwasher only when it is full, health codes permitting.
(l.) Cook with lids in place on pots and kettles. It can cut heat requirements in half.
(m.) Thaw frozen foods in refrigerated compartments.
(n.) Fans that cool workers should be directed so they do not cool cooking equipment.
(o.) Consider using microwave ovens for thawing and fast-food preparation whenever they can serve to reduce power requirements.

ELEVATORS

Following are a few of the options which should be considered in an effort to provide the elevator service required while conserving energy in the process. It should be noted that some of these options are mutually exclusive. In other words, if you pursue one given option, it would be impractical or impossible to pursue another. Determination of which options best suit your needs can be made only after careful review of traffic patterns, elevator controls, etc. If possible, contact the manufacturer, his representatives or distributors, to obtain assistance in performing such a review.

MINIMAL EXPENSE

(a.) Encourage staff members (and perhaps visitors) to use the stairway when only a few stories are involved and when security permits.
(b.) Perform a traffic review to determine if the facility is properly elevatored, or over- or under-elevatored during different periods of the day. If acceptable, take one or more elevators out of operation at least during periods of light traffic.
c. If your building has automatic load-shedding or demand-limiting equipment, connect elevators to the system to enable automatic shut-down of one or more to limit peak demand.
d. If elevators are taken out of service, waiting period (floor dwell time) automatically will be increased. If none are taken out of service, however, floor dwell time can be lengthened thus increasing the passenger load factor.
e. If elevators have demand type controls, adjust controls so that the fewest number of elevators travel the shortest distance that demand on the system allows.
f. Do not permit elevators to time out and shut down too rapidly. They should idle long enough so that power consumption is equal to or just less than power consumed in motor generator starting.

SIGNIFICANT EXPENSE

g. Consider utilizing solid state motor drives instead of motor generator sets. Solid state motor drives typically provide energy savings of from 25-30% as compared to motor generator sets.
h. Consider installation of demand-type elevator controls on elevators having through-trip or collective controls so elevators may be adjusted to ensure that the fewest number of cabs travel the shortest distance which demand on the system allows.

ELECTRIC POWER

MINIMAL EXPENSE

General

(a.) Through letters, memoranda, signs, personal contact and other means, encourage all building personnel to turn off all electrical equipment not in use, including portable fans, typewriters, calculators, coffee pots, etc.
(b.) Consider removing excess water coolers and vending machines or turning them off when not needed.
(c.) Disconnect all unnecessary apparatus and devices, for example, ventilation fans in elevators where smoking is not permitted.

Utility Cost Management

As you probably are aware, utilities have several different rate structures and, in many cases, more than one may be applicable to your facility. As you may not be aware, however, the utility does not have to give you the most favorable rate. In other words, if a new rate structure has been instituted since your facility was built, and if the new rate can be used in your building, it will be up to you to know whether or not the new rate is more favorable. The utility will tell you, but you are the one who must ask. As a result, it is suggested that you gather information which relates to purchased utilities, especially electric.

You also should be aware of what the utility has planned for the future to aid you in your own forecasting and planning. This information can be obtained from the local utility and from your State public service commission.

Review Rate Structures: Many electric utilities have

ten or more different services (rate schedules) each often subject to one or more riders. Contact an appropriate utility representative to find out what different rates, services, schedules and riders are available. Have customer service representatives explain utility operations and go over yours to suggest ways of economizing.

Ik with other electric customers in a position similar to your own. Identify the rate schedules they are using, what their use characteristics are, and how much they pay. Review current bills for each service and ask yourself: "Is the bill computed properly?" "Why am I on this rate?" "Why don't I qualify for a better rate?" Get a satisfactory answer to *each* question. Contact a utility representative for help. Have him review each service. Ask him if other rates apply or could be made to apply. Determine advantages and disadvantages of each.

Recognize that utilities are not required to give you the best possible rate. They will tell you about the alternatives if you ask, but it's up to you to make a decision. If you do decide to change rates, determine what the impact will be—if any—on building systems.

Utility Bills: All utility bills for the past five years should be reviewed to determine their accuracy. In fact, there are companies which can do just that for you (see discussion below on utility consultants).

In most cases, a bill will include charges for:

Energy: Most electric utilities use a "block" approach for the energy charge, that is, so much per kWh for the first 100 kWh, so much per kWh for the second thousand, and so on. In most cases, the more kWh you consume, the less per kWh you pay.

Fuel Adjustment: Many electric utilities have imposed a fuel adjustment which reflects the increased cost of fuel. It can be a substantial charge. (Gas utilities have something similar called a purchased gas adjustment charge (PGA) which reflects adjustment to gas bills based on fluctuations in the wholesale cost of gas.)

Customer-Related: Some utilities add what's called customer-related costs. These comprise a special charge which reflects part of the distribution investment, part of the operating and maintenance costs, costs for accounting and collection, and so on. It if isn't billed separately, it may be included with the energy cost.

Demand: The demand charge is designed to make the customer pay his fair share of the utility's fixed investment in the production, transmission and distribution equipment required to meet his maximum requirements. The charge is based on the rate at which electricity is consumed. The more used at any given time, the larger the utility's investment in generation, transmission and distribution systems has to be. For example, consider two users: A and B, both consuming an equal number of kWh each day. User A consumes electric energy 24 hours a day and user B consumes it 8 hours a day. User B requires the utility to have generating and distribution capacity three times that ired to serve user A, so user B is billed for this extra investment.

The consumer's actual demand is computed as the average amount of energy consumed in a predetermined interval, usually 15 minutes (other intervals also are used by the utilities, particularly 30 minutes and 60 minutes). Regardless of the interval, the highest demand recorded during a month becomes the actual demand for the month.

Many utilities also employ a ratchet clause which states that no matter what your actual demand may be in any given month, the demand for which you are *billed* may be no less than a certain percentage of a demand recorded during the summer months. This already has been discussed.

Low Power Factor Penalty: Another charge sometimes applied, is a penalty for low power factor, a subject discussed below.

Utility Consultants: You may find it desirable to call in a utility consultant to just check your figures or, at the other extreme, to perform an all-out research effort. There are three basic kinds of consultants: consulting engineers, electrical contractors, and contingency fee consultants.

A consulting engineer typically undertakes the work required for a fee so you will have a reasonably good idea of what to expect in terms of your cost. The electrical contractor usually works on the same basis or may follow the procedure used by a contingency fee consultant who is paid on the basis of how much money he saves you. A typical contract calls for a flat service fee plus additional fees for savings. In addition, the company will research your utility needs and will look for any refunds due you and, of course, take a certain portion of these savings too.

You should be circumspect about retaining any consultant. Follow guidelines given in Chapter V.

Maintenance

A proper program of electrical system maintenance can help prevent excessive energy losses, reduced equipment life, and hazardous conditions associated with poorly maintained equipment.

As an initial step, a load survey of the building's electrical distribution system should be made by a qualified professional electrical engineer or contractor. Although probably adequate when first designed and installed, the system may not now be able to carry proper current due to changes in layout and uses. Additions or shifts in motors may have affected working voltage of the system, thus affecting motor operation, lighting efficiencies and conductor loading. The load survey should indicate problem areas. As examples, low voltage conditions on motors cause high amperage draw which increases line losses. Overvoltage causes some motors to become less efficient. Undersize wire increases line loss. Loose connections and bad contacts cause increased amperage draw and power loss as well as heating and arcing which is both inefficient and dangerous. Unbalanced voltages in three-phase motors can create inefficient motor operation. Power leaks to ground also can cause substantial loss of energy, arcing and, reduced equipment life.

Assuming that repairs and maintenance are per-

formed as needed, regular checks of voltage at the terminals of power and lighting circuits should be made. Constant rated voltage is necessary to obtain maximum efficiency and usable life from installed equipment.

Systematic records should be kept of all surveys, regular checks, maintenance and investigation performed, etc. In this manner you will be able to determine when correction is required, whether equipment is failing, etc.

Equipment and Control Rooms

Water, dust, heat, cold, humidity, dryness, corrosive atmospheres, vibration and other conditions all affect the performance and usable life of electrical apparatus. For this reason, it is essential to regulate to as great a degree as possible the environment of equipment and control rooms where the majority of electric apparatus are located. It is suggested that such rooms be kept relatively dry and that appropriate ventilation be installed for enclosed rooms to prevent heat build-up. High humidity can increase dirt build-up on electrical parts and cause inefficiencies and, in some cases, total breakdowns.

SIGNIFICANT EXPENSE

Demand Management and Control

The effectiveness with which energy is used is rated in terms of load factor: the ratio of energy use (kWh) to highest demand (kW) x time, usually measured as 720 hours—the number of hours in 30 days. For example, if you consume 700,000 kWh in a 30-day period and during that time establish a peak demand of 1500 kW, you'd have a load factor of 64.8%.

In essence the lower the established demand, the higher the load factor. The higher the load factor is, the lower the relative cost for electric service.

The techniques used most often to improve load factor are demand management and demand control. The two are not synonymous terms. Demand control refers to the electro-mechanical procedure of load shedding. Demand management encompasses demand control as well as other activities which can help reduce demand charges even more. Here follows a brief listing of steps which should be taken to implement a demand management program.

Analyze Operations: To determine potential for improving load factor, analyze demand records to determine when demand peaks typically occur during operating hours.

Observe operations to determine what in particular is responsible for peaks. Once you find that out, determine what you can do to sequence processes or events to hold peaks down. If two pieces of equipment are started simultaneously, for example, could start-up times be sequenced so surges do not occur at the same time? Could some operations be scheduled so that one begins after the other ends?

The demand savings to be obtained this way usually require no capital expense and they can be significant.

Develop Load Data: The specific research data you need to develop a demand control system specification may or may not be on hand. Essentially what is needed is information on the rating of each electrical load. If comprehensive as-built drawings are available, the task should be relatively simple. If not, consider making a power survey using a recording wattmeter or other instruments to develop accurate data on how much power is being used by equipment at a particular time. Other information you should collect relates to any expansion or alteration planning which could somehow have a bearing on future demand requirements.

Identify Primary and Secondary Load: Each load should be identified as either primary or secondary.

A primary load is one which cannot be interrupted. A secondary load is one which can be interrupted, rescheduled, or deferred and cause no problems in terms of comfort, process or productivity.

Typical secondary loads include: lighting, electric heating units, electric cooling units, chillers, air handling units, exhaust fans, waters heaters, pumps, electric boilers, furnaces, ovens, incinerators, air compressors, and snow melting systems, among others.

Analyze Secondary Loads: Once secondary loads are identified, determine their wattage ratings and establish an order of priority. The more essential secondary loads should be listed first so they can operate last out-first in while lower priority loads operate first out-last in. Before making any decisions, analyze the impact of shedding for each load. To do this, first determine the negative impact which shedding the load will have on health care, process, comfort, productivity or environment. Second, determine the negative impact on the equipment itself. Frequent operation of controls usually will shorten expectant life and increase maintenance costs, factors which have to be related to savings in electrical costs.

Once controllable loads and priorities are identified, determine how much demand reduction can be obtained and the economics of various types of demand control systems. Utilize consultants, electrical contractors, manufacturers' representatives or others to provide guidance.

Power Factor Improvement

Determine whether or not your institution has a low power factor either by having a power survey conducted or, if your utility imposes a penalty charge for low power factor, by reviewing monthly power bills. Causes for low power factor typically are lightly loaded motors which draw excessive amounts of reactive power and increase energy losses in the overall distribution system. Power factor correction can be made through installation of capacitors at utilization equipment locations. Costs of equipment and installation usually can be paid back quickly, if (and only if) the utility charges for reactive power supplied. It is advisable to review the need for and amount of power factor correction on specific types of loads with either the utility, equipment manufacturer, or your consultant.

INTERIOR SPACE UTILIZATION

The way in which interior building space is utilized can have a pronounced effect on energy utilization. Some of the potentially beneficial modifications which should be considered include:

Work Methods Improvements

MINIMAL EXPENSE

(a.) Consider combining operations and work elements, changing sequence of operations, simplifying necessary operations, eliminating unnecessary work, and establishing preferred work methods. In this way, for example, trips between floors via the elevator can be reduced if several routine tasks can be undertaken while on the floor involved, instead of making two or three trips to perform each task separately.

Equipment and Materials Relocation

MINIMAL EXPENSE

(a.) Consider locating all equipment which requires close temperature and humidity control in a common space to be served by a common system.
(b.) Where practical, place all heat-producing equipment such as duplicating machines in one area to enable easier control for heating and cooling purposes.
(c.) Locate wall hangings, displays and furniture away from supply and return air grilles and registers to prevent obstruction of air flow.

SIGNIFICANT EXPENSE

d. Consider removing partitions to create an open space effect which will permit much freer movement of air and a reduction in lighting requirements.

Other

MINIMAL EXPENSE

(a.) Close off unused areas and rooms. Where possible, be certain that blinds or other shading devices are drawn, registers closed, etc.
(b.) If possible, have persons working after hours in noncritical areas work in proximity to one another to lessen lighting and HVAC (heat, ventilating and air conditioning) requirements.
(c.) When repainting, consider use of light wall surfaces to reflect both heat and light.
(d.) If possible, place in proximity to one another those persons whose tasks require similar lighting levels.

ADVANCED TECHNOLOGIES

For our purposes, advanced technologies are those which include waste heat reclamation systems and solar energy systems. Applicability of any one of these technologies, or specific versions of them, depends on numerous different factors. Any of them, in general, require substantial capital expense. In some cases, however, paybacks can be suprisingly rapid.

Waste Heat Recovery Systems

Waste heat recovery results in utilization of heat energy that otherwise would be rejected to waste. As such, heat recovery conserves energy, reduces operating costs, and reduces peak loads.

The following discussion is intended to provide some basic information on the types of heat recovery systems available and some of their general applications.

a. *Rotary Heat Exchanger*

The rotary heat exchanger uses a heat transfer medium in the form of a cylindrical drum or wheel. When rotated slowly between the supply air stream and exhausted air stream it absorbs heat from the warmer air stream and rejects heat to the cooler air stream. In addition to sensible heat transfer, the wheel can be hygroscopically treated with a desiccant which transfers water vapor from the humid air stream to the drier air stream. Nonhygroscopic wheels transfer water vapor when the temperature of one air stream is below the dew point temperature of the other and there is direct condensation of water vapor. During operation at temperatures below 32° F, freezing usually is prevented by preheating the supply air.

Rotary heat exchangers are normally economical for all applications of 4000 cfm or more of ventilation air. Operating at approximately 8 to 10 rpm with a face velocity of 550 fpm, the nonhygroscopic rotary exchangers recover 70 to 80% sensible heat and 40 to 60% latent. Hygroscopic or enthalpy exchangers recover 70 to 80% total heat.

The location of the supply and exhaust ductwork in close proximity of each other can be an obstacle in many applications especially when exhaust systems are contaminated. In these cases, purge sections must be added to the wheel and special filtration may be necessary in the supply air.

b. *Air-to-Air Heat Exchangers*

Air-to-air exchangers transfer heat directly from one air-stream to another through direct contact on either side of a metal heat transfer surface. This surface may be either convoluted plate (more common for low temperature use in HVAC system) or tube (more common for boiler flue gas heat transfer). Air-to-air heat exchangers may be purchased as packaged units or can be custom made. They transfer sensible heat only by the physical dimensions of the space available.

The efficiency of each installation and cost should be calculated based on the particular circumstances that apply. Although efficiencies of air-to-air heat exchangers generally are below 50%, it must be recognized that they are relatively inexpensive, have low resistance to air flow, require no

motive power input, and are troublefree and durable.

c. *Run-Around System*

A limitation associated with passive heat recovery devices is that the supply and exhaust duct work must be close together. In some applications this may be physically impossible. In addition, cross contamination caused by leakage from exhaust to supply streams may be unacceptable when the exhaust contains noxious or poisonous fumes, or if there is a need for cleanliness. Both of these disadvantages can be overcome by using a run-around system which consists of finned-tube water coils located in the exhaust and supply air stream, and a pump circulating water or a water/antifreeze solution between the coils. In this form the system is for sensible heat recovery only. It is seasonably reversible, preheating in the winter and precooling in the summer. As with other heat recovery devices, the coils are subject to corrosion, condensation and the possibility of freeze-up.

Coils and pump are normally selected to achieve sensible recovery efficiencies of 40% to 60%. Greater efficiencies can be achieved by adding more coils in the heat exchangers to increase their capacity. When finned tubing is added, however, the pressure drop across the coil increases and more fan power is required for the supply and exhaust system. Additional tubing also increases the pumping horsepower required, so gains in efficiency will be partically offset by increased power requirements.

If latent recovery is necessary, the system can be modified by replacing the water coils with a cooling tower surface. Therefore, an additional solution pump is needed to complete the system. This provides total heat or enthalpy transfer as the solution absorbs heat and water vapor from the air streams, and also acts as an air washer or scrubber.

d. *Heat Pipe*

A heat pipe, is a passive heat exchanger which involves a closed fluid cycle within a sealed tube. Cool air passing over one end of the tube is heated when it condenses the fluid enclosed in the tube. The warmer air stream passing over the other end of the tube is cooled when it evaporates the fluid contained in the tube. The action is reversible and operates whenever there is a temperature difference in either end of the tube. Any range of supply air cfm can be handled by the addition of more tubes to the heat exchanger rack. Because they contain no moving parts there is minimal leakage between air streams. Mechanical energy is not used except in the form of increased fan horsepower to overcome static pressure losses. Note that the supply and exhaust ductwork must be brought into close proximity to each other.

e. *Shell and Tube Heat Exchangers*

Shell and tube heat exchangers can be used to exchange heat in liquid-to-liquid, steam-to-liquid, and gas-to-liquid configurations. All three configurations are commercially available in a wide range of sizes and outputs and with reliable heat exchange data. Particularly favorable applications are to capture energy from hot condensate, hot refrigerant gas, condenser water, and hot drain lines from kitchens and laundries. Heat exchanger should be insulated to prevent unnecessary heat loss and should be constructed of materials to suit the application.

f. *Double Bundle Condenser System*

A double bundle condenser is constructed with two entirely separate water circuits enclosed in the same shell. Hot refrigerant gas from the compressor is discharged into the condenser shell where its heat is absorbed by either one of the water circuits or by both simultaneously depending on the requirements of the system at a given time. One of the circuits is called the building water circuit and the other, the cooling tower circuit. The condenser is split into two independent hydronic circuits to prevent contamination of the building water and its associate pipes, coils, pumps and valves with cooling tower water, which may contain dirt and corrosive chemicals. When a double-bundle condenser is added to a standard refrigeration machine the heat rejected by the compressor is made available to the building water circuit.

In certain applications the amount of heat reclaimed during occupied hours may exceed the daytime heating requirements of perimeter zones. This excess heat can be stored for release during times when the building is occupied.

The cost of installing a double-bundle condenser system is such that, in most cases, it probably will be most feasible as a replacement for a system which already is at or near the end of its useful life.

SOLAR ENERGY SYSTEMS

Solar energy obviously has tremendous potential because the energy is free. Unfortunately, the systems required to harness that energy are not free. In fact, the cost of these systems in past years has kept solar energy more of a concept than a practicality. Now that the cost of energy has risen so dramatically, however, the cost of solar energy systems have become more realistic. The fact that the energy source itself is both infinite and pollution-free are two additional positive factors.

Engineering feasibility studies of solar energy systems can be performed by qualified consultants who can select equipment for analysis, estimate costs, and predict annual performance. Because the initial investment required to install one of these systems is significantly higher than that required for conventional systems, special care is necessary to ensure that life-cycle cost economies are determined accurately.

At present, solar energy is used primarily for domestic hot water heating and, to a lesser extent, space heating.

a. *Domestic Hot Water Heating*

Solar water heaters have been used for more than 30 years throughout the world, especially in Israel, Australia, and Japan. Current high costs of energy now have awakened far more general interest. Solar water heaters may be economically feasible in some institutional buildings. Generally speaking, however, it usually is not economically feasible to use a solar system for 100% of domestic hot water requirements unless:

- the collector is used for additional services,
- hot water temperature requirements do not exceed 90F,
- an existing storage tank is oversized for the building requirements, and
- the building is located in a temperate or hot climate zone.

Solar water heaters are commercially available in the United States as components offered separately or together in a complete package. Components include a flat plate collector, storage tank (existing storage tanks can be used), piping, controls, circulating pump and, in climates where the collector is subjected to freezing weather, a heat exchanger with a secondary pump, piping circuit and antifreeze.

The thermal performance of a solar water heating system depends upon:

- climatological and meterological conditions,
- solar collector size, design, and construction,
- orientation of the collector and tilt angle with the horizontal,
- size of the storage tank, and
- temperature of the domestic hot water.

For normal hot water use, approximately one square foot of collector per one gallon of hot water used per day is adequate. If kitchens or other processes require hot water at elevated temperatures, collector area required is from 25% to 50% more. The solar collector can be mounted on the main roof, the roof of a building extension, or on-site. Although each installation must be considered a unique subsystem, the following solar collector installation guidelines should be considered:

i. Provide adequate structural support to carry the dead weight (12 lbs./sq. ft.) of the collector plus wind loading.

ii. Orient the collector 10° west of due south if possible, but 20° either side of due south will not materially affect the performance. If the orientation must be farther to the east or west, plan on additional collector area.

iii. If the collector is used solely to supply hot water, a fixed tilt of latitude plus 10°will usually be optimum. Variations of 10° up or down will not seriously affect yearly performance.

iv. Collector must not be shaded more than 10% of the time, or a larger collector area will be required.

v. Provide approximately one square foot of collector and one gallon of hot water storage capacity per 16 gallons of hot water used per week. If kitchens or other processes require hot water at elevated temperature, provide one square foot of collector per 20 gallons of hot water per year.

vi. The existing domestic hot water heating system even though inefficient or undersized will usually be adequate to provide heat to supplement the solar collector system.

b. *Space Heating and Cooling*

Prior to 1972, only about twenty solar heated buildings were erected in the United States. Of those, only one was an institutional building. Since 1972 there has been a proliferation of solar energy activity in the United States, for both new and existing buildings.

The hardware for solar space heating and cooling includes solar collectors, piping, controls and storage systems which are similar to those used for domestic hot water heating, but with the following major differences:

- The required collector area and storage volumes must be larger and are more costly.
- Collectors must produce hotter water temperatures for space heating. Temperatures up to 180°F are desirable, but lower temperatures can be used.
- The orientation of the collector is more critical.
- Absorber plates with selective surfaces rather than flat black coating are more economically feasible for heating and cooling applications than for solar water heating alone.
- Interface with existing heating and/or cooling system is critical.
- Storage systems must have a greater heat storage capacity per square foot of collector.
- Rocks or phase changing salts can be used for thermal storage instead of water in some cases.
- Collectors can be air- instead of liquid-heating types in selected applications.
- A full sized back-up heating system is required to supplement the solar system.

In most areas of the country the cost of a solar energy system which provides 100% of the heating and/or cooling is prohibitive. These systems can be used to supplement more conventional systems, however. Because of the extremely limited applicability of solar energy to heating and cooling systems of existing buildings at this time—due primarily to cost, space and structural requirements—no further discussion is provided herein.

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July 12, 1977

Senator J. Bennett Johnston, Chairman
Subcommittee on Energy Conservation
and Regulation
Senate Committee on Energy and Natural
Resources
Room 3208 Dirksen Senate Office Building
Washington, D.C. 20510

Dear Senator Johnston:

The American Association of Homes for the Aging appreciated having the opportunity to testify before your Subcommittee on the Administration's proposed National Energy Conservation Policy Act. As we pointed out in our testimony, the legislation is clearly inadequate in that it fails to include nonprofit homes for the elderly in its coverage. These facilities have been burdened in recent years by ever-escalating fuel costs. Yet because of their nonprofit status, and the fact that they are serving a large number of indigent residents, they have been unable to obtain the necessary revenues for meeting these added expenses.

In our testimony we urged that Part C (Energy Conservation Program for Schools and Hospitals) be amended so as to include nonprofit homes for the aging in the class of institutions which could receive federal grants to institute energy conservation measures. We also suggested that these grants be made available to nonprofit organizations which are classified under 501(c)(3) or (c)(4) of the Internal Revenue Code.

Under Revenue Ruling 72-124, a home for the aged must satisfy three primary needs of aged persons in order to obtain a charitable exemption under Section 501(c)(3) of the Internal Revenue Code:

1. the need for housing;
2. the need for health care; and
3. the need for financial security.

The Ruling states that the need for housing will generally be satisfied if the organization provides residential facilities that are specifically designed to

meet some combination of the physical, emotional, recreational, social, religious and similar needs of aged persons. The requirement of meeting the need for health care is met if the organization either directly provides some form of health care, or, in the alternative, maintains some continuing arrangement with other organizations, facilities, or health care personnel designed to maintain the physical, and mental well-being of its residents. The final requirement, that the home meet the need of aged persons for financial security -- that is, their need for protection against financial risks associated with later life -- is satisfied if two conditions exist. First, the organization must be committed to an established policy of maintaining any resident who becomes unable to pay the regular charges. The second condition is that the organization must operate so as to provide its services to the aged at the lowest feasible cost. In qualifying for 501(c)(3) tax exemption a home for the aged must show a demonstrated practice over a period of years of meeting these three primary needs of elderly persons.

Nonprofit homes for the aging are also classified under Section 501(c)(4) of the Internal Revenue Code. Due to the necessity for showing a history of providing for the three primary needs of aged persons, newly constructed nonprofit facilities are often classified by the Internal Revenue Service as 501(c)(4) for a number of years until they can demonstrate a continued commitment to meeting the three requirements articulated in the Revenue Ruling. After establishing this commitment, they are subsequently reclassified as 501(c)(3). A 501(c)(4) organization, under the Internal Revenue Code, must also be not for profit, and be organized exclusively for the provision of social welfare. In order to be classified as 501(c)(4), a home for the aged must establish that it is operated exclusively to promote social welfare through providing for the needs of the elderly population in the community.

In recent years many nonprofit facilities for the elderly have been financed through the Department of Housing and Urban Development's Section 202 Elderly Housing Loan Program. Under this program, nonprofit housing for the elderly is constructed:

> "...to provide homes, not just housing for older persons by giving particular attention to their comfort, safety, and protection with due regard for the dignity of the individual and his need for privacy, independence, and freedom of movement." (HUD Guides for Project Design - Senior Citizen Housing Loan Program)

HUD guidelines also state that:

> "...suitable and adequate facilities for social and recreational activities of the occupants are regarded as essential to the well-being of the occupants and the success of the project."

Thus, a Section 202 housing for the elderly project is a combined housing and services program. These facilities provide the "social components of care" to elderly persons. In some cases, the facility may provide for the housing and financial security needs of elderly persons, but may not offer health care. This is due to the fact that financing under government funding programs does not provide needed funds for the full range of programs and services, as required in Revenue Ruling 72-124. Thus, such a facility would not qualify for 501(c)(3) tax status as it does not provide for all three of the Internal Revenue Service requirements. However, the facility is not for profit and is operated exclusively to provide primarily domiciliary care for aged persons in an environment which enables them to live a fruitful life during their later years.

Under the Section 202 program, the organization must be committed to repaying the federal loan out of its charges to residents. Therefore, the rents are in direct proportion to the amount and duration of the federal loan. Due to this requirement, the home generally cannot have an established policy of maintaining residents who are unable to pay, as the financial operation of the facility is directly dependent on revenues received from residents. Under the Internal Revenue Code, an organization is classified as 501(c)(4) where fees are established to recover the costs of operation, as long as it is organized to provide for social welfare. Clearly, this is the case with Section 202 funded facilities, as they provide a wide range of services in addition to housing at a reasonable cost, including meal, transportation, recreation and other social services.

Nonprofit homes for the aged are classified as either 501(c)(3) or 501(c)(4) by the Internal Revenue Service depending on the range of services which they provide to their residents. The main difference between these facilities is the amount and type of charitable services which they provide to their residents. However, all these facilities are not for profit and need federal financial assistance in order to institute energy conservation measures.

All these nonprofit facilities need federal grants for implementing energy conservation measures in their physical plants. Whether they are skilled nursing or intermediate care facilities, personal care, congregate housing, or independent living arrangements, they cannot obtain needed funds from their elderly residents to meet rising energy costs. They have no surplus revenues to meet these needs, as they are not for profit. It is a great oversight to include facilities serving the young and the sick in the class of organizations which can receive federal grants for instituting energy conservation measures, and yet omit those serving the elderly.

We urgently request that your Subcommittee amend the proposed legislation in order to assist all nonprofit homes for the aging. Only by including nonprofit homes for the aging in the bill's coverage will the Subcommittee

insure that our elderly population will not be shortchanged. We thank you for giving us the opportunity to present our views and will be glad to provide the Subcommittee with any additional information that it might desire.

Very truly yours,

David C. Crowley

David C. Crowley
Executive Vice President

DCC/mt
Enclosure

Senator JOHNSTON. Next, Mr. Davis, president of the National School Boards Association.

STATEMENT OF WILL D. DAVIS, PRESIDENT, NATIONAL SCHOOL BOARDS ASSOCIATION

Mr. DAVIS. My name is Will D. Davis. For some 10 years I have been a member of the Austin School Board of Austin, Tex. I am here today as president of the National School Boards Association. I am pleased to have this opportunity to testify before this subcommittee on part C of the National Energy Act.

The National School Boards Association is the only major education organization representing public school members. We are, in some areas, called school committees or school trustees, but it is essentially the same type of function.

Throughout the Nation, we represent approximately 100,000 of these type of public officials servicing approximately 16,000 school boards. These officials have responsibility in turn for the education of more than 95 percent or 50 million public schoolchildren across the United States.

Currently NSBA is in its 39th year of service.

Senator JOHNSTON. I want to hold the testimony down to 3 minutes. I used to represent school boards. I know about your association.

Mr. DAVIS. Fine. In connection with the National Energy Act, we urge you and the committee, of course, to support the legislation with some recommendations which we have filed in writing with your committee and will make available to the committee staff and committee members.

Our association makes the following specific recommendations about subchapter C. The $900 million authorization is too low in our opinion. The detailed information we have filed indicate schools alone require two or three times that amount, assuming a 40- to 50-percent matching funds.

Additionally, among schools and universities and hospitals, educational institutions account for approximately 85 percent of the square footage and 70 percentage of the energy consumed. Also, there is considerable difference in the governance structure and nature of the type of buildings between schools and hospitals.

Because of that fact, we think there should be some separate grant for each set of these institutions and we would urge educational facilities receive a representative portion of 75 to 80 percent of the available funding.

Third: Funding of basic grants should not begin until fiscal year 1979, because schools, in essence, have already planned and in most cases approved their fiscal year 1978 budgets. It would not be at all easy for schools to find the matching funds for their portion without cutting back on educational programs or increasing current budgets or a loan authority.

Fourth: The Senate bill sets the Federal share at 40 percent. We strongly urge the committee to support a 50-percent share to make it financially feasible for a greater amount of districts to quickly apply for funding.

The Administrator should have authority to waive all or part of the matching requirements for financially handicapped districts in severe financial difficulty.

Local education agencies must be involved in the development of a State plan. The Senate bill has no such provision.

There should be a provision for direct grants in the State plan to the local units without the necessity of going through the State agency.

Our written statement contains these and additional recommendations and justification for these recommendations. We thank you for the opportunity to be here.

[The prepared statement of Mr. Davis follows:]

STATEMENT OF WILL D. DAVIS, PRESIDENT, NATIONAL SCHOOL BOARDS ASSOCIATION

My name is Will D. Davis and I am President of the National School Boards Association. I am pleased to have this opportunity to testify before the Subcommittee on Part C of the National Energy Act. The National School Boards Association is the only major education organization representing school boards members—who are in some areas called school committees or school trustees. Throughout the nation, approximately 100,000 of these individuals are Association members. These people, in turn, are responsible for the education of more than ninety-five percent of the nation's public school children.

Currently marking its thirty-ninth year of service, NSBA is a federation of state school boards associations, with direct local school board affiliates, constituted to strengthen local lay control of education and to work for the improvement of education. Most of these school board members are elected public officials. Accordingly, they are politically accountable to their constituents for both education policy and fiscal management. As lay unsalaried individuals, school boards members are in a rather unique position of being able to judge legislative programs, purely on the standpoint of public education, without consideration to their personal professional interest.

Association policy is determined at the NSBA annual convention at which representatives from across the nation translate policies and resolutions into ongoing programs—including our energy recommendations.

Mr. Chairman, on behalf of the nation's 16,000 school boards, I urge your subcommittee to support, with our recommendations, Part C of the National Energy Act regarding federal energy assistance to schools and hospitals. I will take this opportunity to briefly present some recommendations which we hope your subcommittee consider favorably. In addition, I am submitting a more detailed statement on Part C of the National Energy Act, as well as a summary fact sheet and a copy of our position on schools and a federal energy policy.

As you are probably aware, public schools have experienced rapid increases in energy costs, about 100% increase over the last five years, without a proportionate ability to raise tax revenues. Following the general lines of the Administration's energy policy, federal energy assistance to schools would have the effect of a local property tax "rebate" and would serve as an incentive for communities to make their schools more energy efficient.

In addition, if enegry costs continue to occupy a growing percentage of school district budgets, educational programs and local employment opportunities may have to be reduced. For example, the median school district's budget devoted to energy increased at a rate of 15% over the two year period beginning with the 1972–1973 school year. Nationally, this increase cost the public schools an additional one-half billion dollars—or enough money to hire 43,000 teachers.

While the above figures show the dollar impact of rising energy costs, the school closings probably best demonstrate the severity of the energy problem. Last years alone, 40 million pupil days were lost in 13 states due to energy related school closings. Only an estimated one-third of these days will be made up.

Turning to the specifics of Part C, our Association makes the following recommendations:

1. The $900 million authorization is too low. Schools *alone* would require two to three times that amount, assuming 40–50% federal matching funds.

2. Among schools, universities, and hospitals, educational institutions account for 85% of the square footage and 70% of the energy conserved. Accordingly, educational facilities should receive a representative portion of available funding.

3. Funding of basic grants should not begin until FY 79 because schools have already planned, and in many cases approved, their FY 78 budgets. It would not be easy for schools to find funds for the 50% matching requirement without cutting back on educational programs or increasing current budgets or loan authority.

4. The Senate bill sets the federal share at 40%. We support a 50% share to make it financially feasible for a greater variety of districts to apply for funding.

5. Educators must be involved in the *development* of the state energy plan. The Senate bill has no such provision.

6. Some safeguards, or a percentage set aside should be established to ensure that the effects of "grantsmanship" do not unduly disadvantage the large number of smaller school districts.

Our written statement contains additional recommendations and a more detailed justification for these recommendations. I would be happy to respond to any questions you may have or to provide additional information to the Subcommittee.

Senator JOHNSTON. Mr. Gehrig.

STATEMENT OF LEO GEHRIG, SENIOR VICE PRESIDENT, AMERICAN HOSPITAL ASSOCIATION, ACCOMPANIED BY EDWARD BERTZ, MANAGER, DEPARTMENT OF HEALTH FACILITIES AND STANDARDS

Mr. GEHRIG. I am Leo Gehrig, senior vice president for the American Hospital Association. I have with me Mr. Edward Bertz, the manager of our association's department of health facilities and standards. The association represents some 6,500 member institutions including most of the hospitals in the country and some 24,000 personnel members.

We are submitting a full statement. We have considerable background material, we could share it with your staff. I would like to point out, Mr. Chairman, in our statement we indicate the fact we have been deeply involved in the energy efforts since 1973, with the Energy Office of the White House, the Departments of Interior, HEW, and others, and examples of this continuing effort is provided.

It is fortunate this bill is being considered at this time because its grant program will assist in some important actions that can be taken by hospitals, build upon the concerns and activities that have been ongoing for over the last 3 or 4 years.

Mr. Bertz will indicate some of the key points in part C which we recommend for your consideration.

Mr. BERTZ. My name is Edward Bertz. In an effort to strengthen the bill which, as Dr. Gehrig mentioned, is one that builds on our past efforts. I believe we are one of the first associations to come forth with an energy conservation program for its membership and were so cited.

There are six brief concerns I would like to cover. No. 1: There is a list of energy conservation measures itemized in the bill. We feel the list is too restrictive, it does not allow for another type of category. We believe the list should include such an item as coal conversion. We believe also it should allow activities in the energy recovery area and maybe even some other innovative situations.

We have a hospital in Oregon that has been able to tap geothermal energy which is a unique situation. The bill would not allow for this type of capital expenditure for grant purposes.

First was the energy conservation measure. Second: We feel there should be tight coordination between this bill and some of the existing planning for health legislation. There are two specific acts, the Public Health Service Act, section 1523 of that act and section 1123 of the Social Security Act which placed capital limitations for health care institutions.

We would not be allowed to participate in provisions of this bill unless these Federal programs were tightly coordinated. We would suggest the measures that would be submitted by the hospitals and the educational sectors would be given some priority, perhaps even excluded as a passthrough-type situation for planning purposes.

The third area we have some concern over is that of the role of the State governments in the program. We feel there should be some provision in the bill that would allow more direct Federal intervention in cases where the States would not file a plan or would fail to file an acceptable plan.

We also allude to the fact that there are some States where the constitutions prohibit grants to nonprofit educational, health care institutions. This is ground that should be covered in the bill.

Fourth is the matching grant formula, the 40/60 matching grant. We agree with Mr. Davis. It is insufficient. We feel those institutions that are most in need of help would be unable to come forth with the required 60 percent. We believe we need a more flexible formula in even some hardship case situations where they could get almost a total grant or 90 percent grant, so we would suggest a 50/90 sliding scale of grant awards program.

We believe the bill is remiss in not allowing inclusion of technical assistance capability. We feel in the case of hospitals, many of them have already gone down the road and have done low-cost or no-cost type of provisions and save a considerable amount of energy and now are at the crossroads of having to decide what type of capital investment they would have to have in order to continue their program of energy management.

They need some type of technical analysis capability. I also agree with Mr. Davis, there needs to be an equity between the hospital and the educational sectors rather than setting a percentage allotment for each——

Senator JOHNSTON. You want to be 85 percent for the schools?

Mr. BERTZ. How did you guess? We would suggest a floor, neither sector would get less than 30 percent.

Senator JOHNSTON. Let me say on this question of 60/40, what we are trying to do is get the best bang for the buck, for the Federal dollar. This is not a program of aid to schools or aid to hospitals, I just don't see we could get into the business of putting 90 percent in for schools or for hospitals, that gets you into half of the energy conservation for the Federal dollar. It is just not a program designed to aid schools basically although it would have that secondary and important effect.

[The prepared statement of Mr. Gehrig and supplemental material follow:]

STATEMENT OF LEO J. GEHRIG, SENIOR VICE PRESIDENT, AMERICAN HOSPITAL ASSOCIATION

Mr. Chairman, I am Leo J. Gehrig, M.D., Senior Vice President of the American Hospital Association. With me is Edward Bertz, Manager of the Association's Department of Health Facilities and Standards. Our Association represents more than 6,500 member institutions, including most of the hospitals in the country, extended and long-term care institutions, mental health facilities, hospital schools of nursing and over 24,000 personal members. We appreciate the opportunity to appear before this Subcommittee and share with you our views on S. 1469, specifically Part C of Title I, which would authorize a new program of federal assistance in support of energy conservation measures in schools and hospitals.

We view our presence here today as a part of a continuing commitment to assist health care institutions in energy conservation, that began in 1973 with the development of conservation guidelines for hospitals. This effort was cited by the White House Office of Energy Policy and the U.S. Department of the Interior as the first initiative by a private industry association to encourage energy conservation among its members.

The Association also has developed an energy conservation manual entitled, "Energy Management in Health Care Institutions," which was published jointly by the Departments of Health, Education, and Welfare, and Commerce. The manual, a copy of which is attached, has been distributed to all hospitals in the nation. Further, the AHA has participated in the production of a series of publications and films used in our educational programs to develop greater awareness of energy conservation among health care employees. The AHA continues to build upon the hospital energy conservation program by developing an Energy Conservation Award Program designed to provide hospitals with greater incentives to document and further develop their energy conservation efforts. Therefore, S.1469 is being considered at a particularly opportune time to draw upon the concern and impetus that has already been generated in the health care industry.

We would like to discuss six major concerns with the Administration's proposal for a new federal matching grant program and make suggestions for improvements in Part C of Title I that should help increase the level of hospital participation in the program. Our concerns pertain to: (1) the definition of the term energy conservation measure; (2) the relationship of this program to existing health planning and capital expenditure controls; (3) the role of state governments in the program; (4) the matching grant formula; (5) the provision for a technical assistance program; and (6) the allocation of funds for schools and hospitals.

DEFINITION OF ENERGY CONSERVATION MEASURES

Section 391(2) of the proposed new Part F provides definitions of energy conservation measures for the purpose of the grant program. This section includes an exclusive list of energy conservation measures which are eligible for federal funds. We believe that this listing is too limited in view of the potential savings from additional actions which are not recognized in this section of the bill. Some hospitals are now seeking funding for (1) more advanced approaches to energy conservation, as cited below, and (2) conversion to fuels less affected by critical supply shortages and disruptions. In our judgment, the program should be available to support these initiatives.

Recommendation.—The AHA recommends that the list of acceptable energy conservation measures be expanded to include:

1. Furnace or utility plant and distribution system modifications, including utility plant system conversion of existing oil- and gas-fired boiler installations to alternative energy sources, including coal;
2. Equipment required to operate variable steam, hydraulic and ventilating systems adjusted by automatic energy control systems;
3. Solar space heating or cooling systems or any combination thereof;
4. Energy recovery systems; and
5. Cogeneration systems which produce steam, heat, or other forms of energy as well as electricity for use within a building or a complex of buildings and which meet fuel efficiency requirements.

Further, we recommend that the Administrator of the Federal Energy Administration (FEA) be given the authority to approve additional conservation measures for funding which he deems appropriate.

HEALTH PLANNING AND HOSPITAL CAPITAL CONTROLS

In reviewing S. 1469, we conclude that the proposed energy conservation grant program must be integrated with existing Federal and State statutes that provide for the review and approval of hospital capital expenditures under federally mandated State certificate-of-need (CON) laws under Sec. 1523 of the Public Health Service Act, as well as similar capital expenditure limitations imposed under Sec. 1122 of the Social Security Act.

Under present procedures, energy conservation projects funded under authority of S. 1469 would be subject to CON and/or Sec. 1122 review, as are all other major hospital capital expenditures. It is conceivable that an otherwise acceptable application for energy conservation assistance would be delayed or rejected by such existing review mechanisms because energy conservation is not established as a priority under those review programs.

In order that energy conservation projects be established as a priority for hospitals, Congress must ensure that such a priority is reflected in state CON laws and Sec. 1122 procedures. At a minimum, the energy conservation projects should be given expeditious review and priority status by State or Federal review bodies. National priorities for health planning and energy conservation would, in this manner, complement each other.

A second consideration must be the relationship between energy conservation projects and any limitation that might be placed on hospital capital expenditures as a cost-containment effort. Such a capital expenditure limitation is proposed for hospitals in an Administration bill, S. 1391. It is clear that, in the short range, priority energy conservation measures which include capital investment can be in direct conflict with some cost containment efforts. Therefore, we believe it essential that Congress recognize this fact and provide approval and support for capital expenditures for energy conservation when such projects are approved by the appropriate planning body.

Recommendation.—The AHA recommends that the energy conservation grant program be coordinated with existing Federal requirements for review of hospital capital expenditures, and that such grants be excluded from any calculations pursuant to a dollar limitation on hospital capital investment.

ROLE OF STATE GOVERNMENTS

Sections 303, 304 and 306 of S. 1469 outline the role of State governments in carrying out the proposed program. We are concerned that these provisions would prevent some hospitals and schools from participating in the program if their State governments do not develop a plan acceptable to the Federal Government, or simply do not file a plan. A second problem that would be encountered in a State-administered grant program, as outlined in S. 1469, is that some State constitutions prohibit grants to nonprofit educational and health care institutions.

We suggest that these problems can be resolved by adopting as a model the State government role established in the Hill-Burton program, authorized by Titles VI and XVI of the Public Health Service Act. Under that act, Federal and State governments have worked effectively together with HEW awarding funds directly to applicants, based on State-developed plans incorporating each State's criteria and priorities for hospital capital programs. Adopting this method of allocating funds and making project awards would avoid serious problems in about half the States in awarding grants to many private, nonprofit facilities.

Recommendation.—The AHA recommends that the role of State governments under the energy conservation grant program should be modeled after the method of allocating funds and making project awards described in Titles VI and XVI of the Public Health Service Act. Further, we recommend that in the event a State energy plan satisfactory to the FEA Administrator has not been approved, the Administrator may take such reasonable actions as he deems necessary to assure that the energy conservation program for schools and hospitals may be implemented in such State.

MATCHING GRANT FORMULA

Section 306(b)(2) of the bill requires states to allocate grant funds "on the basis of relative need, taking into account appropriate financial, climatic and

energy conservation factors." The bill further provides for a maximum 40 percent federal share of the cost of each approved project with the remaining 60 percent of funds from nonfederal sources. This limitation on the Federal share of the project cost, in our judgment, may prevent some facilities with the greatest need for energy conservation projects from participating in the program because they are unable to generate the 60 percent matching funds. This possibility exists because in many areas of the country there are almost impossible constraints on access to capital. The deteriorating financial condition of many hospitals precludes internal generation of capital, making it difficult and costly to secure financing in the commercial market. Therefore, such institutions will likely be unable to raise the required matching funds for participation in this program. For example, an urban hospital providing substantial charity care services and maintaining a high percentage of Medicare and Medicaid patients will not have the necessary resources to meet the matching requirements of this bill.

In order to provide for participation of financially needy health facilities, we believe the program should include a more flexible cost-sharing provision which takes into account the financial condition of such institutions.

Recommendation.—The AHA recommends that the 40–60 matching grant formula be amended to provide funds reserved to the FEA Administrator that may be used to pay from 50 to 90 percent of the costs, if the Administrator determines that the applicant meets the criteria of a class of hardship taking into account climate, fuel costs, or fuel availability, inability to provide the matching nonfederal funds and such other factors that the Administrator deems appropriate.

TECHNICAL ASSISTANCE PROGRAM

Many of the Nation's hospitals have already launched active energy conservation programs using the special guidelines developed by AHA. Most of the conservation measures instituted were low cost/no cost measures that produced encouraging levels of energy dollar savings. Some hospitals now, after being enticed by their energy savings experience, are considering long-term capital investments in the more sophisticated approaches to energy conservation.

Technical assistance to aid the facility in conducting cost benefit analyses and feasibility studies is essential to determining the most cost effective energy conservation measures for each unique health care institution. Such technical assistance would enable the hospital to accurately identify and specify energy savings and related cost savings that are likely to be realized as a result of a modification. We believe that a technical assistance program is consistent with the objectives of this bill and will enable each institution to maximize the benefit derived through this Federal grant program.

Recommendation.—The AHA recommends that a technical assistance program be included in this bill to assist the health care facility in identifying the most cost effective energy conservation measures appropriate for the institution.

FUND ALLOCATION FOR SCHOOLS AND HOSPITALS

We recognize and support the targeting of Federal assistance to health care facilities and schools for the development of energy conservation programs. In order to assure that the national goal of energy conservation is adequately addressed, we believe that equity should be maintained in the total authorization of funds as applied to both the educational and health care fields.

Recommendation.—The AHA recommends that schools and health care facilities, respectively, should be allocated at least a minimum of 30 percent each of the funds granted annually for technical assistance programs and for energy conservation projects within each State.

Finally, Mr. Chairman, we believe that the marked-up Energy and Power Subcommittee version of H.R. 6831 affirmatively addresses many of the major concerns of the American Hospital Association by (1) expanding the list of acceptable energy conservation measures and giving the Administrator authority to include additional measures as he deems appropriate; (2) coordinating with existing Federal requirements for review of hospital capital expenditures so that energy conservation projects in health care facilities may receive priority and expedited considerations; (3) revising the State grant program format to one of Federal grants under State plans; (4) adding flexibility to the Federal matching grant formula to permit up to 90 percent grants in cases of severe hardship; (5) including a new technical assistance program; (6) assuring that the schools and health care facilities, respectively, of each State will receive a

minimum 30 percent annual allocation for technical assistance program and energy conservation project grants in the State; (7) providing for implementation of the energy conservation program in schools and health care facilities in the event of a delay or failure of the State to implement the program; (8) initiating a new program of statewide preliminary energy audits; and (9) requiring implementation of low cost/no cost energy saving operating and maintenance procedures before an applicant is eligible for Federal financial assistance.

We thank you for this opportunity to present our views on this legislation and will be pleased to respond to any questions you or other members of the Subcommittee may have.

Energy Management in Health Care Institutions

A Joint Publication of

U.S. DEPARTMENT OF COMMERCE
Domestic and International
Business Administration
Office of Energy Programs

U.S. DEPARTMENT OF HEALTH,
EDUCATION, AND WELFARE
Public Health Service
Health Resources Administration

I. INTRODUCTION

Health care institutions in the United States can make an important contribution to the Nation's energy conservation program and at the same time cut operating costs significantly. They can do this by undertaking an immediate energy management campaign as outlined in this booklet.

Energy conservation can be successfully implemented by health care institutions. For example, a Los Angeles hospital has cut electrical consumption 20 percent with savings of $5,000 a month. A New England hospital has chalked up savings of $3,100 a year on fuel oil alone by simple energy conservation procedures.

Spiraling energy costs make it mandatory for all good businesses to undertake an energy management program. This booklet is designed especially for health care administrators interested in instituting such a program in their facilities.



II. STARTING AN ENERGY MANAGEMENT PROGRAM

There are several important steps in initiating an energy management program in a health care institution:

1. Commitment of Top Management

The commitment of top management is the first essential element to an energy management program. This should not be too difficult to obtain when the increasing costs of energy are taken into consideration.

2. Appointing a Director

Responsibility for the program should be assigned to one person, a decision maker who understands basic energy conservation concepts and is capable of working closely with the medical staff and department heads. The program director also must have access to the chief executive. Energy conservation programs in many institutions frequently are assigned to the administrative engineer.

3. Developing the Program

The program, and the name of the director, should be announced to all department heads and staff officials. A committee then should be chosen to formulate detailed plans and conduct the program. Essential elements in any good energy management program involve measuring the use of energy (taking an energy audit) and setting tough, specific, measurable goals to improve the efficiency with which energy is used.

The committee should develop guidelines, which might include recommendations on departmental surveys, recordkeeping, and energy conservation research.

After an energy audit has been conducted, the committee itself should participate in establishment of short- and long-range goals and then announce them to the organizational units. Each committee member should provide appropriate assistance in achieving the goals.

4. Motivating Employees

Employee cooperation is essential to a successful program, especially in the following areas:

- control of artificial lighting
- use of electrical appliances and business machines
- fresh air ventilation
- use of elevators
- adjustment of thermostats
- use of car pools

Motivation can be instilled in a number of ways, including awards for energy-saving ideas, bulletin boards, posters, staff meetings, and such special devices as conservation symbols at appropriate locations. For example, St. Joseph Hospital in Phoenix adopted the slogan "Energy—Wise Guys Economize" (EWGE) and St. Vincent Infirmary in Little Rock utilized special light switch decals that remind employees to "Kill-A-Watt" by switching off unneeded lights.

III. MEASURING ENERGY USE (TAKING AN ENERGY AUDIT)

One of the first steps in any successful energy management program is an audit of current energy consumption. This provides a base for evaluating the success of your program or elements of the program. One of the best sources of such information is the monthly utility bills, which give a good indication of energy usage over an extended period.

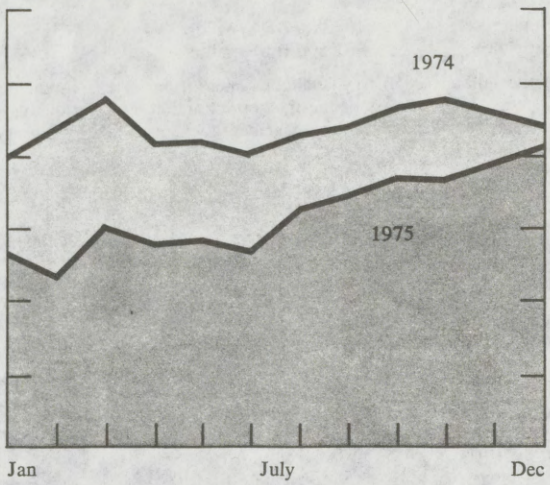
When analyzing energy usage and evaluating conservation programs, there are a number of variables that should be taken into consideration. These include weather variations, bed utilization, new medical procedures, construction programs, and other factors that may affect the consumption figures.

A useful way of measuring energy consumption is to determine the number of British thermal units (Btu's) consumed per square foot of floor space. This enables you to compare your institution with others and also to take into consideration additions or planned additions to your present facilities.

Such a measure of consumption can be expressed in graph form to give an idea of month-to-month changes, as in the following example:

Energy Consumption

THOUSAND BTU PER FT.^{2}



Btu's should be used as the basic unit for analyzing energy data. To do this, however, it is necessary to have a working knowledge of a number of conversion factors.

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Some conversion factors include the following:

1 U.S. barrel = 42 U.S. gallons
1 therm = 100,000 Btu's
1 horsepower = 2,546 Btu's
1 kilowatt-hour (KWH) = 3,413 Btu"s
1 ton refrigeration = 12,000 Btu's per hour
number degree days = 65 minus mean temperature of the day

Fuel heating values are an important factor in managing energy. The following table of values indicates the energy available in a particular fuel source and provides a base of comparison among the different fuels.

COAL

Anthracite	—	25,200,000 Btu's/ton
Bituminous	—	24,000,000 Btu's/ton
Lignite	—	13,600,000 Btu's/ton

RESIDUAL AND MIDDLE DISTILLATE FUEL OILS

Kerosene	—	135,000 Btu's/gallon
No. 2	—	138,700 Btu's/gallon
No. 5, 6	—	150,000 Btu's/gallon

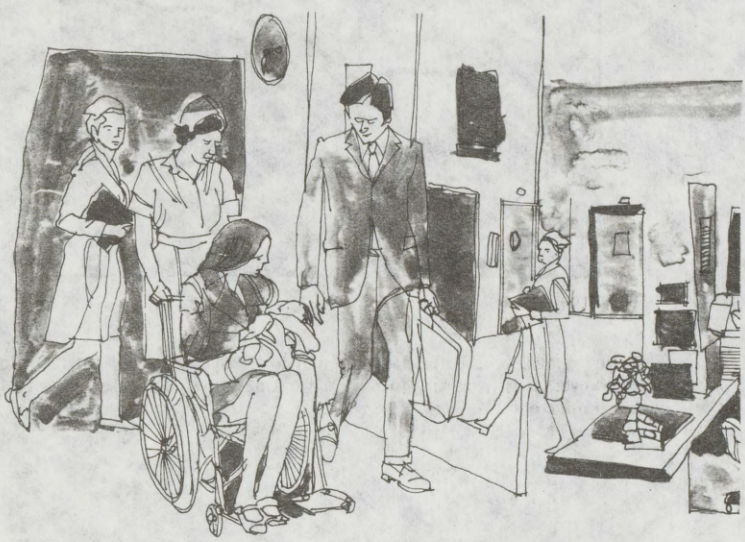
GAS

Natural	—	1,031 Btu's/cubic foot

LP—GASES

Butane	—	102,000 Btu's/gallon
Propane	—	91,500 Btu's/gallon

Knowing the amount of energy available, measuring its use in the various energy systems and processes of the institution, and comparing this usage on a periodic basis provides the basic management tools of an energy conservation program.



IV. ENERGY CONSERVATION CHECKLIST

Health care institutions should conduct a systematic survey of all energy systems to determine if they are operating efficiently and how they might be improved for more efficient operation.
An example of such a survey, with suggested recommendations, follows:

- *Building and Grounds*

1. Boilers—Check oil or gas burners and controls for efficiency, adjusting as necessary. Fuel gas should be analyzed for proper CO_2 content and excess air. Consult boiler manufacturer or fuel supplier for valves and for proper stack temperatures. High stack temperatures may indicate scaled or sooty heat transfer surfaces and low temperatures may cause corrosion of ducts and fans. Clean filters and strainers and be sure correct oil temperatures are maintained. Check for adequate air supply to the burners and check the condition of boiler insulation, refractory, brickwork, casings, safety and relief valves, motors, fans and blowers.

It is desirable to keep a daily record of boiler efficiency to compare performance and spot troubles. This can be done by taking steam-flow and oil- or gas-flow readings. Efficiency equals heat content of steam produced divided by heat input x 100 percent.

2. Pipes—Check pipes for leaks, especially at valves, flanges, pump packing, and safety and relief valves. Repair insulation where necessary and insulate condensate lines. Steam escaping from a tank vent may indicate a waste of steam and condensate. Proper use of steam traps will help maintain the system at design efficiency. Steam traps must be kept in good working condition.



3. Heating, Ventilation, Air Conditioning—Consider reducing air conditioning and heating within medical or legal requirements. Consider installing timers to automatically adjust heating and air conditioning.

Inspect the entire system, including filters, belts, and fans, for efficient operation. Pneumatic control systems should be checked for moisture, which should be drained periodically.

Thermostat controls should be locked or automatically controlled. Settings should be changed only by the engineering staff. Use of drapes as a thermal barrier should be encouraged and opening of windows discouraged.

4. Water Temperatures—Water temperatures supplied to the taps should be reviewed for possible reductions within medical and hygienic requirements. Check all faucets for leaks, and water temperature control devices—including kitchen and laboratory automatic washing equipment—for efficient operation. Special attention should be given the laundry operation for energy waste.

5. Food Preparation—Cooking, heating, and serving equipment should be checked for efficiency. When replacing equipment, special consideration should be given to optimum efficiency. Insulation should be checked on all equipment, especially around the doors. Condenser coils should be cleaned. Refrigerator and freezer doors should be kept open only as long as necessary. Kitchen exhaust hoods of slot-type design are the most efficient.

6. Illumination—Lighting should be reduced in administrative offices—an effective visual sign to all staff of the commitment of top management to the energy conservation program—and in other areas, and light usage continually monitored. Reducing lighting also reduces air conditioning load. Incandescent lighting can be replaced with more energy-efficient fluorescent, mercury or high-pressure sodium lamps. Long-life incandescent bulbs, sometimes recommended for hard-to-reach spots, should be used sparingly.

Energy requirements for startup illumination of fluorescent lamps often is misunderstood. Manufacturers now provide formulas that indicate efficiency "break-even time periods" for shutting off lamps before restarting. These can be posted next to the wall switches. Fluorescent lamp shutoff periods can be as low as 15 minutes and be energy efficient. Time switches may be installed in seldom used areas and light fixtures on high ceilings might be lowered. Incandescent lights should be turned off when not needed.

7. Electrical System—The main and branch electrical distribution systems should be monitored to identify peak demands which may be better distributed.

Electric motors should be sized for peak operating efficiency. Keep all motors on regular preventive maintenance schedule. Use multiple-speed motors for variable pump, blower and compressor loads.

Consider removing excess water coolers and vending machines or turning them off when not needed.

Check electrical outlets and contacts. Poor connections increase resistance and waste energy.

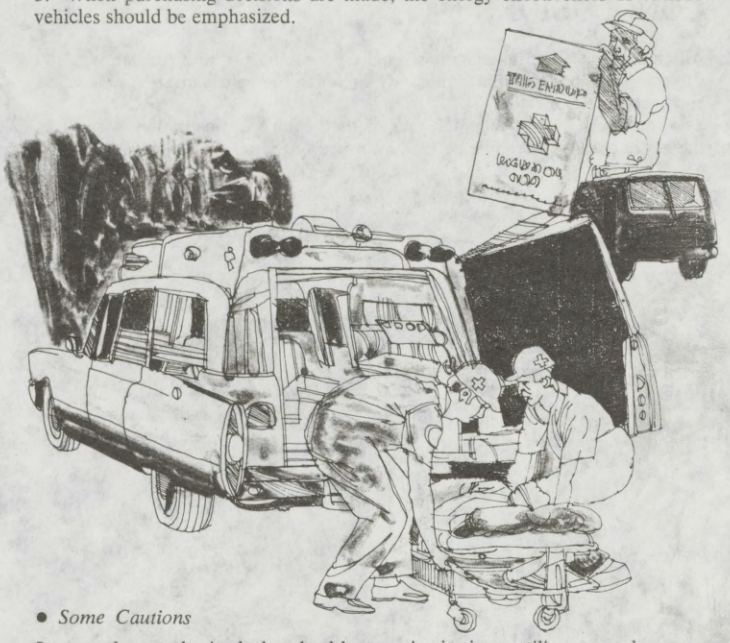
8. Water System—Conduct a monthly audit of water meters for early leak detection.

• *Vehicles*

1. Vehicles used or controlled by the hospital should be inspected regularly to insure that they are maintained in top operating efficiency. The proper adjustment of carburetors, timing, tire pressure, and other mechanical items is most important and should be performed on a regular basis.

2. Use patterns of vehicles should be examined to assure the most efficient scheduling and utilization. Combining trips is just one way in which vehicles can be used more effectively.

3. When purchasing decisions are made, the energy effectiveness of various vehicles should be emphasized.



• *Some Cautions*

It must be emphasized that health care institutions utilize several energy systems that interact with one another. Eliminating energy use in one system may cause even greater use in another. Each system must be studied so that apparent energy saving in one place won't result in greater energy consumption somewhere else.

For example, building zones with high internal heat gains and solar loads may actually increase the demand on the air conditioning system when thermostats are lowered for the winter season.

Removing just one fluorescent lamp from a two-lamp fixture should be avoided as this will reduce ballast life. A ballast will still draw current even with the lamp or lamps removed so ballast and associated lamps should be removed as a unit.

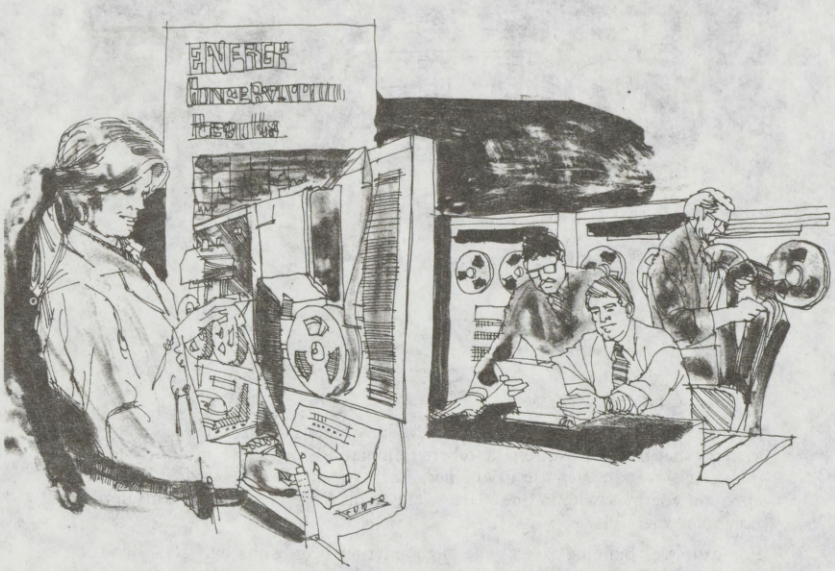
The substitution of single-use dinnerware for general multi-use items that require energy consuming on-site dishwashing facilities does not necessarily reduce total energy use.

Though reducing institutional energy use, such single-use items might well require more energy to manufacture, distribute, and store than the energy needed to clean and sterilize multi-use items.

CONCLUSIONS

All energy conservation programs require constant effort and constant review. Efforts should be reexamined annually, at which time goals must be reassessed and reset.

Top management and all employees of the health care institution, as well as the entire community, must be kept informed of the results.



PROFESSIONAL RESOURCES

A number of professional societies and trade associations have materials and other resources to assist in an energy management program. Health care institutions are encouraged to consult with local hospital engineering chapters for information and particular expertise. Most of these chapters are affiliated with the American Society for Hospital Engineering (ASHE), which can provide chapter names and addresses. The addresses of ASHE and other professional resources are listed below:

1. American Society for Hospital Engineering
   of the American Hospital Association
   840 North Lake Shore Drive
   Chicago, Ill. 60611
2. American Society of Heating, Refrigerating and
   Air Conditioning Engineers, Inc.
   United Engineering Center
   345 East 47th Street
   New York, N.Y. 10017
3. American Society for Engineering Education
   One Dupont Circle
   Washington, D.C. 20036
4. Institute of Electrical and Electronics
   Engineers, Inc.
   United Engineering Center
   345 East 47th Street
   New York, N.Y. 10017
5. American Consulting Engineers Council
   1555 15th Street, N.W.
   Washington, D.C. 20005
6. American Society of Mechanical Engineers, Inc.
   United Engineering Center
   345 East 47th Street
   New York, N.Y. 10017
7. National Society of Professional Engineers
   2029 K Street, N.W.
   Washington, D.C. 20006
8. American Gas Association, Inc.
   1515 Wilson Boulevard
   Arlington, Va. 22209
9. Electric Energy Association
   90 Park Avenue
   New York, N.Y. 10015
10. Department of Health, Education, and Welfare
    Health Resources Administration
    Associate Administrator for Planning,
    Evaluation, and Legislation
    5600 Fishers Lane, Room 10A-56
    Rockville, Md. 20852
11. Office of Energy Programs
    Bureau of Resources and Trade Assistance
    U.S. Department of Commerce
    Washington, D.C. 20230

Additional advice may be obtained by contracting energy suppliers.

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"ROLE OF AHA IN MOBILIZING INSTITUTIONAL ENERGY MANAGEMENT"
JOHN M. STAGL, CHAIRMAN OF THE BOARD
REGIONAL CONFERENCE ON ENERGY MANAGEMENT
CHICAGO, ILLINOIS MAY 2, 1977

ACKNOWLEDGEMENTS....

I WANT TO THANK YOU FOR ASKING ME TO PARTICIPATE IN THIS CONFERENCE ON ENERGY MANAGEMENT. IT'S A HEAVY SUBJECT, AND AN IMPORTANT ONE, BUT I MUST ADMIT I FIND IT A REFRESHING CHANGE.

IN MOST OF MY PRESENTATIONS AS CHAIRMAN OF THE AMERICAN HOSPITAL ASSOCIATION BOARD OF TRUSTEES, I'M ASKED TO DEAL WITH ALMOST UNMANAGEABLE SUBJECTS, LIKE RISING HEALTH COSTS, INCREASING GOVERNMENT REGULATION, NATIONAL HEALTH PRIORITIES, AND SO ON. I CALL THEM UNMANAGEABLE BECAUSE THEY ARE SO VERY GENERAL, SO MULTI-FACETED, AND SO SUBJECT TO DIFFERENT PERSPECTIVES BY BOTH SPEAKER AND AUDIENCE. THEY ARE UNMANAGEABLE BECAUSE THEY ARE "ISSUES"—NOT AGREED UPON "PROBLEMS"—AND ALL YOU CAN DO WITH ISSUES IS TRY TO DEFINE THEM AND THEN DEBATE THE DEFINITIONS.

THAT'S NOT THE CASE TODAY. WE'RE NOT HERE TO DEBATE WHETHER THERE IS A PROBLEM—WE KNOW THAT ALREADY. WE'RE HERE TO COME UP WITH SOLUTIONS, AND TO SHARE EXISTING SOLUTIONS. THERE IS A SINGLENESS OF ATTITUDE AND PURPOSE, AND I APPRECIATE BEING A PART OF THAT KIND OF EFFORT.

WE'RE HERE TO TALK ABOUT ENERGY AND ENERGY MANAGEMENT, AND AS I SAID AT THE OUTSET, IT'S A HEAVY AND IMPORTANT SUBJECT.

SOME THREE YEARS AGO, THE ARAB BOYCOTT BROUGHT HOME TO ALL OF US THE REALIZATION OF WHAT A VITAL ROLE A CONTINUING ENERGY SUPPLY PLAYS IN AMERICAN LIFE- - - -AND IN HEALTH CARE DELIVERY. DURING THE PAST TWO YEARS, WHEN I SERVED AS CHAIRMAN-ELECT OF THE AHA BOARD, AND NOW AS CHAIRMAN, I'VE BEEN IN A UNIQUE POSITION TO WITNESS THE EFFECT AND THE RESPONSES TO AN EVER TIGHTENING SUPPLY OF ENERGY ON HOSPITALS. I'M HERE TODAY TO TELL THIS HOSPITAL STORY, BOTH FROM THE VIEWPOINT OF A HOSPITAL ADMINISTRATOR AND AS ONE WHO HAS TRAVELED THOUSANDS OF MILES, CRISS-CROSSING THE NATION, TALKING WITH HOSPITAL AND OTHER HEALTH OFFICIALS FROM NEARLY EVERY STATE OF THE UNION.

MY STORY IS NEITHER LENGTHY NOR COMPLICATED. IT HAS ONLY THESE THREE POINTS:

1. HOSPITALS ARE AS THREATENED AS EVERYONE ELSE. WE DON'T FEEL THAT NEEDED AND APPROPRIATE PRIORITY ALLOCATIONS LESSEN THE THREAT OF ENERGY SHORTAGES ON HEALTH CARE INSTITUTIONS; NEITHER DO THEY LESSEN OUR OBLIGATION TO PITCH IN AND HELP RESOLVE THOSE SHORTAGE PROBLEMS AS BEST WE CAN.

2. THROUGH THE EFFORTS OF THE AMERICAN HOSPITAL ASSOCIATION, ALLIED HOSPITAL ASSOCIATIONS AND INDIVIDUAL INSTITUTIONS, HOSPITALS HAVE A HEAD START ON MOST SECTORS OF AMERICAN LIFE IN DEALING WITH THE WORSENING ENERGY SITUATION. WE REMEMBER WELL WHAT HAPPENED THREE YEARS AGO WHEN MANY HOSPITALS OPERATED FROM DAY TO DAY, NOT KNOWING IF THEY COULD GET FUEL OR VITAL SUPPLIES TO REMAIN OPEN. ONE SMALL HOSPITAL IN MINNESOTA ACTUALLY SHUT DOWN ITS BOILERS IN SUB FREEZING TEMPERATURES FOR A NUMBER OF HOURS SO THAT IT COULD GET THROUGH THE NIGHT TIME HOURS. WE LEARNED OUR LESSON WELL. WE BEGIN THEN AND CONTINUE TO MINIMIZE THE EFFECT OF DWINDLING ENERGY SUPPLIES ON HEALTH CARE DELIVERY THROUGH A VARIETY OF PROGRAMS.

3. Despite our efforts, the situation continues to worsen. There is only one answer. We must work even harder to make sure that the sick and injured people of every community will have a place to go that can respond to their needs.

Let me briefly elaborate on each of these three points. Restated, they are:

1. How hospitals are threatened by the energy situation;
2. What hospitals are doing; and,
3. What further might be done as things get tougher.

In order to understand the threat, we must first understand the ways in which a hospital relies on energy. It is easy to see how they rely on fuel to heat the physical facility, to prepare meals, to provide hot water for patient care and medical procedures and steam for sterilization of medical devices. We also realize the need for electricity for lighting, appliances and the ever increasing complex medical instrumentation. Even a cut-back on electrical power, as many communities have experienced, can cause great difficulties with medical instrumentation.

One big area of energy reliance we tend to forget is that of medical supplies. The same petrochemicals used for fuel and electrical power generation are used to make certain pharmaceuticals, and the plastics in medical devices.

Nor can we forget fuel used for transportation—both to obtain supplies and to get hospital personnel to their work. Three years ago, some hospitals were on the

VERGE OF CLOSING, AND A FEW CLOSED DESIGNATED WINGS OF FACILITIES--ALL BECAUSE PERSONNEL DID NOT HAVE GASOLINE TO REACH THE HOSPITAL.

ALL THE THREATS I'VE MENTIONED THUS FAR DEAL WITH THE AVAILABILITY OF ENERGY. TIED VERY CLOSELY TO THIS IS THE COST OF ENERGY. NOT LONG AGO, ELECTRICAL AND FUEL COSTS MADE UP ONLY ONE-HALF OF ONE PERCENT OF THE TOTAL OPERATING BUDGET OF A HOSPITAL. NOW IT IS GENERALLY FROM 2 TO 5 PERCENT OF THE BUDGET. SOME HOSPITALS HAVE INDICATED THAT THIS AMOUNTS TO OVER $4.00 A PATIENT DAY. THERE IS NO REASON NOT TO BELIEVE THAT THIS AMOUNT WILL INCREASE EVEN MORE IN THE MONTHS AND YEARS AHEAD.

RECOGNIZING THE IMPACT OF ENERGY SHORTAGES ON AVAILABILITY AND COSTS, I'D LIKE TO TURN TO MY SECOND POINT. THE HOSPITAL SECTOR LEARNED ITS LESSON WELL. WORKING WITH FAR FEWER RESOURCES THAN MOST PUBLIC AND GOVERNMENTAL SECTORS, HOSPITALS SET ABOUT THE JOB OF MINIMIZING A VERY THREATENING SITUATION.

THE AMERICAN HOSPITAL ASSOCIATION WAS RECOGNIZED BY THE FEDERAL ENERGY ADMINISTRATION AS THE FIRST NATIONAL ORGANIZATION TO DEVELOP, PUBLISH AND DISTRIBUTE TO ALL ITS MEMBERS A BASIC ENERGY CONSERVATION DOCUMENT. INCLUDED WITH IT WERE A SET OF GUIDELINES ON WHAT TO DO IN CASE OF ELECTRICAL POWER REDUCTION.

THE AHA STAFF, WORKING WITH STAFFS OF MEMBER HOSPITALS, SPENT COUNTLESS HOURS NEGOTIATING WITH FEDERAL ENERGY REGULATORY BODIES TO MAKE SURE THAT HOSPITAL PATIENTS WEREN'T VICTIMS OF UNTHOUGHTFUL REGULATIONS. IT WOULD SEEM THAT THE HUMAN NEEDS SERVED BY OUR HOSPITALS WOULD NOT HAVE TO BE FOUGHT FOR. BUT THEY WERE. IN FACT, WE FOUND THAT ONCE ALLOCATION PRIORITIES WERE ATTAINED, THEY COULD BE LOST OVERNIGHT. EVEN NOW WE FIND THE OBVIOUS PRIORITY NEEDS OF PATIENTS GRADUALLY ERODING. INTRASTATE DISTRIBUTORS IN SOME AREAS, PARTICULARLY THE MIDWEST, ARE CONSIDERING SHIFTING FUEL PRIORITIES IN SUCH A WAY THAT LARGER HOSPITALS WOULD BE IN A LOW PRIORITY POSITION IN CASE OF FUEL SHORTAGES. LARGE HOSPITALS WOULD BE PLACED IN THE SAME CATEGORIES AS COMMERCIAL AND INDUSTRIAL USERS. THE RESULT WOULD BE FREQUENT AND LONGER CURTAILMENT OF NATURAL GAS SUPPLIES, WHICH WOULD FORCE HOSPITALS TO USE THEIR MORE EXPENSIVE BACK UP ENERGY. NEEDLESS TO SAY, AHA WILL PETITION FOR INTERVENTION BY THE FEDERAL POWER COMMISSION IF THOSE SHIFTS IN PRIORITIES COME ABOUT.

IN ADDITION TO ITS CONSERVATION DOCUMENTS AND CONSULTATION WITH FEDERAL REGULATORS, THE AHA AND OTHER HOSPITAL ASSOCIATIONS HAVE DONE EXTENSIVE EDUCATIONAL PROGRAMMING ON ENERGY CONSERVATION AND WISE ENERGY MANAGEMENT. HOSPITALS HAVE FOUND THAT IN SAVING ENERGY, THEY ARE ALSO CONTAINING PATIENT COSTS. SAVINGS OF 10 TO 20 PERCENT ON ELECTRICAL AND FUEL BILLS ARE NOT UNCOMMON.

IN OUR ENERGY MANAGEMENT PROGRAMS WE HAVE STRESSED THE NEED FOR A COMMITTMENT BY THE CHIEF EXECUTIVE OFFICER OF THE HOSPITAL. HE OR SHE HAS BEEN ENCOURAGED TO NAME A SPECIFIC PERSON TO HEAD A TOTAL ENERGY MANAGEMENT PROGRAM, INVOLVING ALL HOSPITAL DEPARTMENTS AND THE MEDICAL STAFF. THESE VIEWS WERE ENUNCIATED IN THE TEXT OF A BOOKLET PREPARED BY AHA AND PUBLISHED JOINTLY BY NBS AND THE DEPARTMENT OF COMMERCE. A DETAILED MANUAL HAS NOW BEEN PREPARED BY NBS IN CONSULTATION WITH AHA WHICH YOU FOUND IN YOUR CONFERENCE FOLDERS. ITS CALLED "TOTAL ENERGY MANAGEMENT IN HOSPITALS." WE URGE YOU TO READ AND IMPLEMENT IT.

THIS CONFERENCE, AS YOU KNOW, IS THE LAST IN A SERIES OF REGIONAL ENERGY CONFERENCES THAT HAVE BEEN CONDUCTED SINCE JANUARY. AT EACH OF THE PREVIOUS CONFERENCES, THE GUIDELINES WERE DISTRIBUTED AND I'M TOLD BY AHA STAFF THAT WE HAVE RECEIVED NUMEROUS EXAMPLES OF HOSPITAL ENERGY CONSERVATION PROGRAMS THOSE GUIDELINES HAVE SPAWNED OBVIOUSLY, YOUR COLLEAGUES IN THE HOSPITAL FIELD ARE FINDING THEM HELPFUL; I'M SURE YOU WILL TOO.

THIS BRINGS ME TO ANOTHER FACET OF THE LESSON THAT HOSPITALS HAVE LEARNED WELL. WE LEARNED THAT THERE WAS ONE FEDERAL AGENCY, BELIEVE IT OR NOT, THAT WAS DEDICATED TO ASSISTING THOSE OF US IN THE VOLUNTARY SECTOR WITHOUT THREATENING OR IMPOSING FEDERAL REGULATIONS. LIKE A BREATH OF FRESH AIR, WE STRUCK A CLOSE WORKING

RELATIONSHIP WITH BURT KLINE AND HIS NEW ENERGY ACTION STAFF. IT HAS BEEN A FRUITFUL RELATIONSHIP IT TERMS OF HELP TO HOSPITALS IN DEVELOPING ENERGY CONSERVATION PROGRAMS. WE RECENTLY HEARD THE PRESIDENT OF THE UNITED STATES URGE A TOTAL DEDICATION OF THE NATION TO ENERGY CONSERVATION. WELL, I AM HAPPY TO REPORT THAT WE IN THE HEALTH SECTOR HAVE BEEN GOING FULL STEAM FOR THREE YEARS, IN GREAT PART BECAUSE OF THE ASSISTANCE OF THE NEW ENERGY ACTION STAFF. HERE ARE JUST A FEW THINGS ACCOMPLISHED JOINTLY:

1. FOUR REGIONAL CONFERENCES ON HOSPITAL ENERGY MANAGEMENT IN 1975;
2. SIX MORE CONFERENCES THIS YEAR, THIS BEING THE LAST;
3. TWO FILMS ON ENERGY CONSERATION, AVAILABLE THROUGH AHA; AND
4. A BOOKLET ON SOLAR ENERGY FOR HEALTH CARE INSTITUTIONS.

I COULD GO ON BUT I WANT TO SAVE TWO MINUTES FOR MY FINAL POINT WHICH IS NOT SO ROSY--NOR DOES IT PERMIT US TO REST COMFORTABLY ON PAST LAURELS.

WE HAVE EXPERIENCED MANY ASPECTS OF THE EVER TIGHTENING VICE OF ENERGY SHORTAGES--AND WE HAVE RESPONDED RATHER WELL UP TO NOW. BUT THINGS AREN'T GOING TO GET BETTER. DR. KING HUBBERT SAYS THAT A CHILD BORN IN THE 1970'S WILL SEE THE U.S. USE 80% OF ITS NATURAL GAS IN HIS LIFETIME.

WE HAVE LEARNED TO MAKE PROVISIONS FOR ALTERNATE FUELS. AN AHA SURVEY REVEALED THAT ALMOST TWO-THIRD OF U.S. HOSPITALS USE NATURAL GAS AS A PRIMARY FUEL.

HOSPITALS WENT TO GREAT EXPENSE TO SINK RESERVE OIL TANKS IN CASE THEY WERE CUT OFF FROM NATURAL GAS. BUT WE FOUND SOME HOSPITALS DURING THIS PAST, BITTERLY COLD WINTER CUT OFF FROM NATURAL GAS AND UNABLE TO OBTAIN OIL. ONE HOSPITAL IN SOUTHERN OHIO HAD ONLY A TWO DAYS SUPPLY WITH NO OIL COMPANY WILLING TO PROVIDE MORE UNTIL A STATE AGENCY INTERVENED. IN THE PITTSBURGH AREA, WHERE NATURAL GAS CURTAILMENTS WERE AS HIGH AS 75 PERCENT, A CONVOY OF TANK TRUCKS FROM NEW JERSEY HAD TO BE BROUGHT TO GET OIL TO HOSPITALS.

HERE ARE A FEW THINGS I BELIEVE WE MUST DO AS THE SITUATION WORSENS:

FIRST, SUPPORT AHA IN ITS EFFORTS TO MAINTAIN HIGH PRIORITY ALLOCATIONS OF OIL AND NATURAL GAS TO PROTECT THE NATION'S SICK AND INJURED. THIS MAY EVEN MEAN A LEGISLATIVE EFFORT. WE HAVE DISCOVERED THAT IF WE DON'T TELL THE HOSPITAL STORY, NO ONE WILL. WE HEAR THAT IF THE NATION MUST CHOOSE BETWEEN OIL FOR MAINTAINING JOBS AND OIL FOR HEALTH CARE, WE WILL DRAW THE SHORT STRAW. WE MUST EMPHASIZE THAT HOSPITALS THEMSELVES PROVIDE JOBS. IN FACT, THEY ARE MORE LABOR INTENSIVE THAN ALMOST ANY OTHER INDUSTRY. WE MUST KNOW THE HOSPITAL STORY AND TELL IT WELL.

SECOND, INTENSIFY YOUR EFFORTS IN HOSPITAL ENERGY MANAGEMENT, NOT ONLY TO SAVE ENERGY BUT ALSO TO CONTAIN COSTS. IF WE ARE COMMITTED TO COST CONTAINMENT, AS WE SAY WE ARE, WE MUST DEDICATE OURSELVES TO SAVING ENERGY IN AN ORGANIZED ON-GOING PROGRAM IN EACH HEALTH CARE INSTITUTION. IMPLEMENT THE "TOTAL ENERGY MANAGEMENT MANUAL" AND IN SO DOING BE SURE TO LET YOUR COMMUNITY KNOW WHAT YOU ARE DOING, LEST THEY THINK YOU ARE DOING NOTHING.

THIRD, WORK CLOSELY WITH YOUR STATE AND METROPOLITAN HOSPITAL ASSOCIATIONS

IN THEIR EFFORTS TO ORGANIZE ENERGY PROGRAMS. RIGHT NOW, STATE GOVERNMENTS ARE DEVELOPING OR HAVE DEVELOPED STATE-WIDE ENERGY CONSERVATION PROGRAMS REQUIRED IN FEDERAL LEGISLATION. ILLINOIS' GOVERNOR THOMPSON, FOR EXAMPLE, HAS ALREADY TOLD US OF HIS. GET INVOLVED IN THE DEVELOPMENT OF THESE PROGRAMS AS PART OF YOUR MISSION AND ALSO TO GUARD AGAINST IMPRACTICAL STANDARDS THAT CAN COME FROM THESE PROGRAMS. WE KNOW WE CAN'T REDUCE HOSPITAL CONSUMPTION TO A RIGID BTU'S PER SQUARE FOOT AS SOME ARE PROPOSING. OUR INSTITUTIONS VARY IN AGE AND LOCATION FAR TOO WIDELY TO LIVE BY SUCH A STANDARD.

4. FINALLY, LET US WORK TOGETHER, COOPERATING BY SHARING INNOVATIVE IDEAS, DOING OUR SHARE IN LOCAL, STATE AND FEDERAL EFFORTS IN THIS VITAL AREA. THIS MEANS KEEPING OURSELVES AWARE, TALKING TO OTHERS AND ATTENDING CONFERENCES SUCH AS THIS. WE HAVE A BIG AND SOBERING JOB AHEAD. WITH GROUPS LIKE THIS ASSEMBLED HERE, WE WILL MEET THE CHALLENGE.

IT HAS BEEN A PLEASURE BEING WITH YOU. THANK YOU FOR LISTENING!

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FOR IMMEDIATE RELEASE

AHA ISSUES GUIDELINES TO
CONSERVE ENERGY IN HOSPITALS

CHICAGO -- In anticipation of President Richard M. Nixon's energy cutbacks, the American Hospital Association (AHA) has mailed to all its 7,000 member hospitals a set of energy conservation guidelines, designed to help save fuel in health care institutions, and to contribute toward easing the energy crisis now facing the country.

Although new AHA-supported federal legislation (Public Law 93-159, passed by Congress on Nov. 14, and signed into law by the President on Tuesday, Nov. 27) will assure hospitals priority consideration in fuel oil allocation this winter, the AHA has recognized the health care industry as a major user of energy, and has developed the guidelines to assist hospitals in providing community leadership in conserving the nation's scarce energy resources.

In a letter to the hospitals, John Alexander McMahon, AHA president, said the guidelines "should prove helpful to health care institutions in formulating specific inhouse programs for energy conservation." The guidelines are meant to help hospitals both conserve energy and deal with electrical power "brownouts."

AMERICAN HOSPITAL ASSOCIATION
75 YEARS OF PROVIDING SERVICES FOR THE NATION'S HOSPITALS
840 NORTH LAKE SHORE DRIVE / CHICAGO, ILL. 60611

93 653 863

"Add 1/AHA Issues Guidelines to Conserve Energy in Hospitals/AHA"

"As the nation braces to meet an energy crisis that is already being experienced in some sectors, health care institutions should exercise every effort to conserve on the use of energy supplied by power sources in critical demand, without jeopardizing essential patient care," the guidelines began.

Gov. John A. Love, Assistant to the President, and Director of the new White House Office of Energy Policy, acknowledged the AHA's early actions to obtain priority consideration for hospitals in fuel oil allocation this winter, and expressed his congratulations to the hospital association for providing the initiative and organizing an agressive industry-wide energy-saving campaign.

"If all of us, both as individual and as institutional energy users, will assume that kind of personal, citizen responsibility to contribute to this effort," Gov. Love said, "I am confident the United States will successfully meet our present problems -- without jeopardizing any of the country's essential services."

U.S. Secretary of the Interior Rogers C.B. Morton, whose Department is in charge of coordinating national energy conservation efforts, has emphasized the extremely serious nature of America's current energy crunch, declaring in a statement last week in Memphis, "There is a possibility of an oil shortage of up to 25 percent early next year, but I believe it can be met by conserving energy.

"First priority must be to provide fuel to hospitals, schools, police and fire departments, and other emergency facilities," the Interior Secretary said. "Next will be commercial uses of oil, and the last priority will be private uses by the general public."

"Add 2/AHA Issues Guidelines to Conserve Energy in Hospitals/AHA"

Commenting on the AHA's new energy conservation guidelines, the Interior Secretary said, "I am most encouraged to see the nation's hospitals set this kind of constructive example for other industries -- by demonstrating a willingness to look for savings in their own operations, and to hold down energy consumption, consistent with the health and welfare of their patients."

"It's a good step in the right direction," he asserted, "and shows outstanding leadership by the country's health care industry."

The AHA guidelines recommended that hospitals, to most effectively handle the problem, designate a staff member as the overseer of an energy conservation program on an ongoing basis, with instructions to coordinate the entire effort closely with physicians in the institution to assure that patient care is not impaired.

Every staff member should participate in the program by taking simple steps such as turning off all lights and appliances not in use, keeping windows closed whenever possible, keeping thermostats set at minimum levels without adversely affecting patient care, and walking instead of using an elevator whenever practical, the guidelines suggested.

Heating systems should come under close scrutiny, the AHA said, with boilers cleaned and maintained according to a planned schedule. Pointing out that a carelessly maintained heating system can be a large fuel-waster, the AHA recommended checking combustion efficiency, cleaning heat transfer surfaces, and carefully maintaining electric motors and pumps.

"Add 3/AHA Issues Guidelines to Conserve Energy in Hospitals/AHA"

Hot water temperature should also be lowered where there is no danger to patient care or sanitation standards, and all leaky faucets should be repaired. The AHA also recommended that light usage be held to a minimum, with any special decorative lighting or other electrically-powered decorative units turned down or shut off.

The AHA urged administrators to stimulate staff awareness of the problem through approaches such as award programs for the "Best Energy Conservation Idea of the Month." Monthly meetings of key department heads to discuss the progress of the conservation program were also suggested, with regular reports being issued to all personnel.

Hospitals were urged by the AHA to take similar steps in dealing with power "brownouts," defined as a voltage reduction of at least three to eight percent at the electrical generating source.

The AHA again recommended that an institution appoint someone to be responsible for directing and coordinating both the preparation and implementation of policies and procedures for dealing with electrical voltage drops, with close physician cooperation.

Because some electrical equipment can be easily damaged by a drop in voltage, the AHA suggested that a list of minimum allowable voltages for each piece of equipment in the hospital be compiled so that if voltage dropped, decisions could be made as to which equipment to remove from service. Among the equipment to be closely watched, the guidelines warned, are building control systems; computer equipment; elevator controls; air handling systems; refrigeration systems and ice machines; water supply and purification systems; and page and signal systems.

"Add 4/AHA Issues Guidelines to Conserve Energy in Hospitals/AHA"

It is important that prior decisions be made as to which services and functions will be limited or discontinued depending on severity of the voltage reductions, the guidelines pointed out, and procedures might be developed to deal with such conditions as maintaining life support equipment and service, maintaining critical patient care, etc.

The AHA advised hospitals to issue written instructions for hospital personnel faced with power "brownouts" and to institute training programs to clarify each person's general role in the conservation of electricity.

Earlier this month AHA president McMahon had made a strong appeal in a personal visit to Gov. Love at the White House Office of Energy Policy, asking for priorities for hospitals in the mandatory distribution of fuel supplies.

"Unless priorities are established, hospitals will be limited in their ability to treat patients in adequately heated rooms and have energy resources for treatment and dietary purposes as well as for the administration and sterilization of hospital supplies and equipment," McMahon also declared in a letter to the director.

Several hospitals around the country have already reported fuel problems. Some suppliers have told hospitals they cannot promise supplies for more than a few days. The East Moline State Hospital, Moline, Ill., which normally has a one to 1-1/2 month supply of fuel heating oil on hand, was running as low as a three-to-four-hour supply, according to Clyde Wood, business administrator.

Special offices have been set up by state governments, in compliance with the federal mandatory allocation program, to deal with hardship cases resulting from the energy crisis. McMahon urged hospitals anticipating fuel shortages in the coming months, but who cannot get assurances of relief from their suppliers, to file immediately a notice of hardship with their designated state office.

"Add 5/AHA Issues Guidelines to Conserve Energy in Hospitals/AHA"

If a hospital cannot get relief from the state, it may appeal to the regional or field office of the Department of the Interior, and finally to Eli T. Reich, Administrator, Office of Petroleum Allocation, Department of the Interior, Washington, D.C. Those federal offices have authority to order a supplier to provide hospitals with adequate amounts of fuel oil.

The AHA has also established a special "hot-line" phone contact at its Chicago office for use if hospitals are unable to resolve their fuel supply problems on their own.

Senator JOHNSTON. Mr. Reed.

STATEMENT OF GEORGE E. REED, ACTING GENERAL COUNSEL, U.S. CATHOLIC CONFERENCE

Mr. REED. The conference has a significant number of organizations in every field of charitable endeavor: health, education, and welfare. We have been initially concerned and deeply concerned with language in subparagraph 10, section 309 of part C.

This language is unduly restrictive. I will not, at this time, develop our constitutional position for two reasons: First, it is fully developed in our statement, second, I undertand that yesterday the spokesman for the administration conceded our position and has requested that the offending language be deleted.

We join in the request, that the language of subparagraph 10, which would have the effect of disqualifying a significant number of our educational institutions, be deleted.

The second proposition that would have bearing on us is the fiscal mechanism which has been employed. As the bill currently stands, the Federal money would be channeled to the States and grants would be made by the States. We have not done very well under that type of situation even in welfare benefits; school lunch, for example.

Under the national school lunch program, about 50 percent of our schools are participating or are allowed to participate. In other mandated programs for the benefit of children, the ESEA, the unduly strict constitutional provisions of several States have prevented us from getting the benefit of the federally mandated services.

Accordingly, we suggest a somewhat different mechanism along the lines of the Hill-Burton Hospital Construction Act also employed in the Higher Education Facilities Act. This essentially would involve the State-Federal energy commissions in the establishment of priorities, and sending those priorities to the Federal agency. The Federal energy agency in Washington would make the final determination and would then make grants to the particular institution.

Senator JOHNSTON. The House took the offending language out.

Mr. REED. We are pleased with this action.

Senator JOHNSTON. You want us to go along with that?

Mr. REED. I would definitely hope the Senate would embody that same position in the final bill.

Senator JOHNSTON. It seems to me saving energy, whether it is done in a Baptist institution, athiest institution, or Catholic institution, it is still energy saving and that is what we are after. I think it would be appropriate that language come out.

Mr. REED. Thank you, Senator. Those two propositions are the ones we wish to emphasize: First, the one we have just discussed; and second, a revision of the fiscal mechanisms, so the federally mandated benefits would be available as the Congress wishes.

Senator JOHNSTON. Thank you very much.

[The prepared statement of Mr. Reed follows:]

STATEMENT OF GEORGE E. REED, GENERAL COUNSEL, U.S. CATHOLIC CONFERENCE

The United States Catholic Conference is the national level agency of the Catholic bishops of the United States. It conducts programs in many areas of

interest to the Church and the Catholic people of the Nation, including education and health affairs.

S. 1469, the proposed National Energy Act includes in Part C, a proposed Energy Conservation Program for Schools and Hospitals, and it is that part of the bill which is the subject of this statement.

In his address to the nation on April 18, President Carter began with the following statement:

"Tonight I want to have an unpleasant talk with you about a problem that is unprecedented in our history. With the exception of preventing war, this is the greatest challenge that our country will face during our lifetime."

"The energy crisis has not yet overwhelmed us, but it will if we do not act quickly. It's a problem that we will not be able to solve in the next few years, and it's likely to get progressively worse through the rest of this century.

"We must not be selfish or timid if we hope to have a decent world for our children and our grandchildren. We simply must balance our demand for energy with our rapidly shrinking resources. By acting now we can control our future instead of letting the future control us."

The President closed his address with this statement:

"There should be only one test for this program—whether it will help our country. Other generations of Americans have faced and mastered great challenges. I have faith that meeting this challenge will make our own lives even richer. If you will join me so that we can work together with partiotism and courage, we will again prove that our great Nation can lead the world into an age of peace, independence, and freedom."

Throughout his address to the Nation, and again two days later in his Address to a Joint Session of the Congress, the President stressed the need for energy conservation, the need for sacrifice, and the need for fairness. He said: "The fifth principle is that we must be fair. Our solutions must ask equal sacrifices from every region, every class of people, and every interest group . . ."

Conservation of energy was described as the "cornerstone" and the "first goal" of the nation's program to meet the crisis brought about by dwindling supplies of oil and natural gas and growing consumption. Among the proposals for conservation in homes and buildings, the President listed:

"First, direct Federal help for low-income residents; next, an additional 10-percent tax credit for business investments in conservation; third, Federal matching grants to nonprofit schools and hospitals; and public works money for weatherizing State and local government buildings."

The Catholic Church in the United States sponsors and operates a vast number of nonprofit charitable, educational and health care institutions and facilities. The 1976 Official Catholic Directory lists 245 Colleges and Universities serving 432,000 students; 969 Diocesan and Parochial High Schools serving 563,000 students; 647 Private High Schools serving 332,000 students; 8,139 Parochial Elementary Schools serving 2,500,000 students; 345 Private Elementary Schools serving 64.000 students; 109 Protective Institutions serving 9,207 students; 660 General Hospitals with a total bed capacity of 161,000; 90 Special Hospitals with bed capacity of 7 782. In addition. there are 205 Orphanages and Asylums with 15,350 resident children; 458 Homes for the Aged with 53,000 guests.

We cannot tell you how many energy consuming buildings and structures are involved in this private, voluntary effort to serve the people of this nation. Certainly there are many thousands of school buildings and hospital structures, including hundreds of dormitories and residential halls.

We are confident that all of the Catholic organizations and institutions which operate these many thousands of buildings are willing and indeed anxious, to participate in the national program to conserve energy and insure the future well being of the Nation—a vast national effort which President Carter has described as "the moral equivalent of war, except that we will be uniting our efforts to build and not to destroy."

All of our schools and all of our hospitals, as well as the other charitable institutions, would like to share in the common effort and join in the common sacrifices. They will do so to the extent that the Congress and the President permits them to do so and to the best of their financial ability.

The cost of fuel for heating and cooling of school buildings and hospitals is a substantial portion of the operating expenses for all of these Catholic organizations and institutions. The increased cost for fuel resulting from increased demand, inflation and the tax measures proposed by the President's program will be a great burden. The costs must be borne almost entirely by the

patrons of our elementary and secondary schools, and for the most part by the students and their families in the case of colleges and universities.

The ability of Catholic and other nonprofit schools and hospitals to adopt energy conservation measures desired by the national program will be dependent to a large extent upon the provisions of Part C of S. 1469.

Part C would authorize a three-year, $300 million program of grants to schools and hospitals to pay for up to 40 percent of the cost of installing certain specified energy conservation materials and equipment. The eligible projects are listed in Section 391 (2). Included are such things as insulation of walls, ducts and pipes; double glazing of windows; energy control systems, solar heating and cooling systems; furnace modifications; caulking and weather stripping.

In his address to Congress, and in the fact sheets given to the press and public, the President several times described the program provided in Part C as authorized Federal matching grants to "nonprofit schools and hospitals." Nothing was said to indicate that it was intended to limit participation in the program to those nonprofit elementary and secondary schools which are not Church-related. There was no indication that elementary and secondary schools sponsored by Churches and other religious organizations and which thereby fall into the category of operating facilities for "sectarian instruction" and "religious worship" would be barred from participation in the energy conservation effort provided through the Federal matching grants.

Nor was there any indication that those colleges and universities which desire to participate in the program would be required to accept a restriction upon present and future use of their building so as to prevent such buildings from ever being used for any amount of sectarian instruction or religious worship.

The U.S.C.C. was surprised upon reading S. 1469 to discover, in Section 391(10), the following language:

"(10) the term 'school facilities' means buildings housing classrooms, laboratories, dormitories, athletic facilities, or related facilities operated in connection with a school, *but does not include any facility used or to be used for sectarian instruction or as a place for religious worship*, or any athletic facility used primarily for athletic exhibitions, contests, games or other events for which admission is charged to the general public." (emphasis added).

What does this language mean, and why is it included in a bill devoted to conservation of energy and installation of such items as storm windows and solar furnaces?

While there seems to be some differences of opinion among members of the White House and the Administration as to reasons why this restriction is proposed to be imposed on the use of school facilities, there can be no doubt about what the effect of this language would be.

First, the effect would disqualify from participation in the program of Part C about 90 percent of the more than 14,000 nonprofit elementary and secondary schools in this nation. This is so because these schools are Church-related and Church-sponsored. They are, almost without exception, by definition, engaged in "sectarian instruction." Their buildings are frequently used as a place for "religious worship" although their primary purpose is to provide quality education, of both a sectarian and secular nature.

Second, the effect of this language would be to disqualify from participation in the program a large number of buildings on college and university campuses, particularly on the campuses of private, Church-related colleges and universities. This would result because many buildings, including classroom and residential structures, are used as a place for carrying on sectarian instruction and religious worship. The religious dimension at the typical private schurch-related college is not confined to the college chapel.

Students frequently form and are encouraged to form religious clubs on both private and public college campuses. There are such groups on almost every college campus in the nation. Their meetings, their worship services, their prayer sessions are conducted in numerous structures. All such structures would be disqualified from participation, or, in the alternative, the college would be required to agree never in the future to use such buildings for sectarian instruction or religious worship.

We do not want to overstate the case, but the Congress should be aware that this language is not an insignificant impediment to the success of Part C. Much more is involved than a handful of chapels. The number of college structure that would be disqualified, or restricted as to future use, will run into the thousands.

The U.S.C.C. has sought an explanation for the inclusion of such a religious-test restriction. We have received no formal reply, but have been advised informally that the White House staff came to the conclusion that such a restriction was necessary to avoid potential constitutional problems. We have also been advised that the White House staff has reviewed this question and has now determined that the restrictive language is not required. We understand that the Administration has advised this Subcommittee that it has no objection to deletion of this language.

The U.S.C.C. most emphatically is opposed to this provision of S. 1469 which seeks to impose unnecessary limitations upon the President's national energy program. We urge that this Committee delete the entire religious restriction clause from Section 391(10). There are adequate and specific restrictions upon the use of the project grant funds which will insure that these funds will be used and can only be used to provide a share of the cost of energy savings materials and equipment.

We would like to call the Committee's attention to the action already taken by the Subcommittee on Energy and Power of the Committee on Interstate and Foreign Commerce of the House of Representatives. The House Subcommittee has reported favorably a revised version of Part C and has eliminated the religious usage language of the original bill.

It is also important to note that the Senate Committee on Human Resources earlier this year considered the question of including private-nonprofit schools in a similar energy conservation program and voted unanimously to include them. It also did not place restrictions on the use of school facilities.

The Committee is hearing today from representatives of public schools, public and private colleges, and public and private hospitals. We have consulted with some of these representatives and know that there is a large amount of agreement among us on various problems presented by Part C of S. 1469, that are not related to, or only indirectly result from the President's decision to include private nonprofit institutions in this program. We wish to call attention to two matters which we consider to have a considerable potential for thwarting the success of this portion of the national energy program. We would urge the Committee, with its expertise and experience to study these matters in detail and rewrite the bill to solve the problem which we foresee.

First, there is the problem created by the procedure by which grants will be made to State governments before they are, in turn, made to public and private schools and hospitals. Experience, particularly in the National School Lunch program, has shown that somewhere around half of the states have constitutional and other legal impediments to making grants to private institutions, both Church-related and secular. These impediments are among the reasons why the Congress in 1963 developed the method by which Higher Education Facility Grants and Loans are made directly to institutions under a system of State allocations and priorities. A similar procedure has been used for many years in the Hospital Construction Acts, such as Hill-Burton.

The House Subcommittee on Energy and Power considered this question of direct grants under State allocations and incorporated the changes which we are recommending. We are advised that the White House staff also has stated its approval of this change in the Administration's bill.

We also ask the Committee to examine closely the language in the proposed section on Nondiscrimination—Section 309. That same language was considered by Congress last year as part of the Revenue Sharing Act of 1976 and rejected in favor of a more precise wording developed in the Senate.

We do not know why it has been considered necessary to include a nondiscrimination paragraph in Part C of S. 1469 since all of the schools and hospitals involved are already covered by the provisions of both Title 6 and Title 7 of the Civil Rights Act of 1964, as amended, as well as the provisions of the Federal Contract Compliance regulations and the nondiscrimination regulations of the Internal Revenue Service.

If the nondiscrimination provision of S. 1469, Part C, is deemed necessary, then we recommend adoption of the same language contained in the Revenue Sharing Act. This will avoid creating problems by deviating from the provisions of the Civil Rights Act. Specifically, Title 6 of the Civil Rights Act does not contain the words "religion" or "sex". Title 7 contains special provisions relating to employment discrimination by churches and other religious institutions, including colleges and hospitals. Also, the prohibition on "sex" discrimination by schools and colleges in Title IX of the Education Amendments of 1972, are very detailed

and specific to avoid interfering with the enrollment and hiring practices of Church-related schools and colleges, and also the enrollment and faculty practices of elementary, secondary and undergraduate schools for men and women.

Earlier in this statement, a reference was made that our testimony would provide the conclusions U.S.C.C. reached on the legal and constitutional implications of Part C. We now turn to that part of our testimony.

PART II. CONSTITUTIONAL CONSIDERATIONS INVOLVED IN S. 1469

As indicated earlier in this statement the President in his address to the Congress and to the nation, emphasized the following principles:

First, the necessity for conservation of energy, and

Second, the necessity for fair treatment.

The President's position with respect to nonprofit schools and fairness characterizes the history of this country concerning the conservation of natural resources. During World War II, the administration of President Roosevelt established a system of priorities to conserve critical resources. This policy was administered by the War Production Board, which treated nonprofit schools and nonprofit hospitals in the same manner as public schools and public hospitals. A specific issue arose with respect to nonprofit schools and particularly parochial schools. In short, could they be given the same priority treatment as public schools. The War Production Board ruled at the highest level that the same treatment must be afforded. Similarly, Congress in enacting the Disaster Relief Act of 1974 (PL 93-288) included all nonprofit schools in need of disaster assistance.

Section 4(a) of the Act contains the following highly relevant finding:

"The Congress hereby finds and declares that there has been substantial damage to educational institutions as a result of hurricane and tropical storm Agnes; that disaster relief for public educational institutions is adequately covered by legislation heretofore enacted; that nonprofit private educational institutions are not provided disaster relief benefits comparable to those provided to public educational institutions; that nonprofit private educational institutions have a secular educational mission; that students attending nonprofit private educational institutions that have been damaged or destroyed will have to be provided for in public institutions if the former institutions are not restored; and that these facts compel enactment of special measures designed to provide nonprofit private educational institutions which were victims of this catastrophe with disaster relief benefits comparable to those provided for public educational institutions."

It is submitted that this is an appropriate legislative precedent for guiding the Congress in dealing with the issue raised with respect to nonprofit schools. PL 93-288 is but one of the many Federal laws which included all nonprofit schools within their benefits. Other highly relevent statutes are:

The National School Lunch Act, PL 79-396 (1946);

The Surplus Property Act of 1944, as amended, PL 92-362 (1972);

Title III of the National Defense Education Act, PL 85-864 (1958) which entitled schools to borrow funds at low interest rates for equipment and minor remodeling to be used in connection with the teaching of science, mathematics, and languages;

The Elementary and Secondary Education Act of 1965, PL 89-10 (1965);

and many others which reflect the proposition enunciated in 1976 by the Supreme Court in *Roemer* v. *Board of Public Works of Maryland*, 96 S. Ct. 2337 (1976). There the Court asserted that:

"Religious institutions need not be quarantined from public benefits that are neutrally available to all."

Despite the presidential mandate for fairness and the necessity for using the most efficient means to conserve energy, S. 1469, the bill introduced to implement the President's program would have the effect of excluding approximately 90 percent of all of the nonprofit schools of the nation.

Subparagraph 10 of Section 391 of S. 1469 provides as follows:

"(10) The term 'school facilities' means buildings housing classrooms, laboratories, dormitories, athletic facilities, or related facilities operated in connection with a school, but does not include any facility used or to be used for sectarian instruction or as a place for religious worship, or any athletic exhibitions, contests, games, or other events for which admission is charged to the general public."

This provision is not consistent with the President's message to the Congress nor to the people. No reference was made in either address to the exclusion of 90% of the nonprofit schools and, understandably so, because the message was predicated upon fairness. We find it hard to believe that the President intended to exclude any portion of the nonprofit school system of our country and especially not on the basis of religion. Not only is it inconsistent with his enunciated principles of equity, but it would adversely affect the conservation of energy.

An analysis of the whole conservation program discloses the following essential characteristics:

1. An increase in the cost of energy due to taxation;
2. A provision of rebates to individuals to offset the increase;
3. A provision of tax credits to commercial consumers to moderate the impact of the increased cost of energy;
4. Rebates and tax credits to encourage conservation policies;
5. Matching grants to stimulate the development of conservation procedures.

Clearly, in light of the President's message to Congress and to the nation and to his consistent devotion to principles of equity, it is hard to believe that there is an intention to exclude 90 percent of the non-profit elementary and secondary schools of the country because sectarian instruction is provided during a part of the day in addition to basic secular instruction. The principles of separation of church do not warrant this conclusion.

In the first place, the decisions invalidating aid to church related schools are not controlling for the proposed legislation and its specific purpose bears no relationship to the educational process. Nor does it violate any of the tests adopted by the Supreme Court of the United States for determining whether legislation amounts to an establishment of religion. The Court has repeatedly declared that legislation is constitutional if it has the following characteristics:

1. A secular legislative purpose;
2. A primary effect which does not advance nor inhibit religion;
3. Does not result in excessive governmental entanglement with religion.

Certainly, inclusion of all nonprofit schools in the President's energy program is consistent with a legitimate public purpose. S. 1469 itself reflects a national purpose of the highest order and participation in this program partakes of this national purpose.

Several cases involving aid to educational functions in parochial schools have been declared to be unconstitutional on the ground that the legislation is of such a nature as to require a continuing surveillance of religious institutions to insure that statutory restrictions are obeyed. [*Lemon* v. *Kurtzman*, 403 U.S. 602 (1971), *Meek* v. *Pittenger*, 95 S. Ct. 1753 (1975).] In the words of the Court in *Lemon* v. *Kurtzman*, *supra*,

"These prophylactic contacts will involve excessive and enduring entanglement between church and state."

This rationale could not be applied to legislation which merely permits church related nonprofit schools to participate in the energy program. The installation of energy saving devices certainly would not constitute even a potential for entanglement. On the other hand, the bill as presently drafted with the restriction on sectarian instruction would require government monitoring to determine whether the applicant facility would be used for religious or sectarian purposes. In short, the present legislation is constitutionally vulnerable on the ground of entanglement.

Finally, it can not be argued with any degree of conviction that allowing church related schools to participate on an equal basis in the energy program will have "a primary effect of advancing religion." The legislation does not build new schools nor add new classroom facilities. It is not designed to aid schools, let alone religion. On the contrary, the compelling public purpose is the preservation of a resource which is linked to the stability of this country.

The resolution of the "primary effect" criterion must be resolved on the basis of the principle enunciated in *Tilton* v. *Richardson*, 403 U.S. 672 (1971), and related cases. There the Court laid down a guiding principle to which it has consistently adhered. It stated:

"Our cases from *Everson* to *Allen* have permitted church related schools to receive government aid in the form of secular neutral or nonideological services, facilities, or materials that are supplied to all students regardless of the affiliation of the school which they attend."

This is the relevant and controlling test for determining the issue with respect to the constitutional character of government aid. No argument is needed to

demonstrate that the installation of energy saving material and devices are nonideological materials which have no connection with religion or religious education.

Despite development of these critical tests for determining the constitutionality of legislation the "no aid" concept is frequently used in a reckless manner in an attempt to draft legislation which avoids the church state issue. This simplistic approach frequently generates a constitutional issue. For example, to strictly implement subparagraph (10) and deprive the church related schools of an opportunity to participate would place a burden on the free exercise of religion. This is the critical church state issue. This very principle is reflected in the majority decision of the key case of *Everson* v. *Board of Education*, 330 U.S. 1, 67 S. Ct. 504, 91 L.Ed. 711 (1947). There the Court stated through Mr. Justice Black:

"Of course, cutting off church schools from these services, so separate and so indisputably marked off from the religious function, would make it far more difficult for the schools to operate. But such is obviously not the purpose of the First Amendment. That Amendment requires the state to be neutral in its relations with groups of religious believers and non-believers; it does not require the state to be their adversary. State power is no more to be used so as to handicap religion than it is to favor them."

We submit that the language of subparagraph 10 in light of the whole energy program would "handicap religion." The taxation of energy would result in additional cost of maintenance of nonprofit schools. Nonprofit schools having a tight budget particularly those schools in the ghetto areas which are serving all religions might be forced to close. Certainly, they would not be able to spend additional money to weatherize the buildings and conserve energy, though they would try.

The language of subparagraph 10 is also susceptible to the interpretation that if a building devoted exclusively to purely secular activities contained a chapel, then it could not participate in the program for the term "school facilities" as defined excludes any place where there is not only sectarian instruction but religious worship. Most universities have chapels and there is a strong possibility that the language in subparagraph 10 could adversely affect universities as well as elementary and secondary schools though, admittedly, the basic thrust is in the area of elementary and secondary institutions.

Though the language to which we have taken exception in subparagraph 10 would have the greatest impact on elementary and secondary schools, it is possible that it also might affect both public and private colleges and universities. Last year, the case of *University of Delaware* v. *Keegan*, cert. denied, 96 S. Ct. 1148 (1976), was before the Supreme Court. The State University sought an injunction preventing priests and students from participating in worship services in a common room of the dormitory in which the students lived. The Supreme Court of Delaware denied the injunction and held that there was no violation of the First Amendment. On February 24, 1976, the Supreme Court denied certiorari. Since the church-state issue was argued vigorously, we cite this experience as one example to demonstrate that public as well as private colleges could be affected if the language of subparagraph 10 remains.

The foregoing propositions in substantially the same form were submitted to the House Subcommittee on Interstate and Foreign Commerce on May 16, 1977 in connection with Subparagraph 10 of Section 301 of H.R. 6831. On the basis of our testimony and that of other witnesses, the offending language defining the term "school facilities" was deleted in the bill reported from the House Subcommittee. It is our understanding that the Administration has no objection to this deletion.

In an extended colloquoy between the panel and the members of the House Subcommittee, the whole question of the method of providing the grants was considered in depth. The U.S. Catholic Conference advanced the proposition that it would be highly advisable to change the method of financing set forth in H.R. 6831 and repeated in S. 1469. We suggested that the method of financing be modeled along the lines employed by the Congress in the Hospital Survey and Construction Act (Hill-Burton Act) 60 Stat. 1040 (1946), and the Higher Education Facilities Act of 1963, PL 88–204 (1963). Under this approach, the final approval would be made by a federal energy agency and the grant would be made directly to the institution. This would avoid unnecessary difficulties with restrictive state constitutions in some areas.

The United States Catholic Conference has had considerable experience in this area. For example, the National School Lunch Act, PL 79–396 (1946) has not

been fully implemented in approximately 50% of the states because of state constitutional inhibitions. Moreover, our experience has indicated that in a program of the character envisioned in S. 1469, it would be preferable if the federal government had more authority in the administration of the law.

This proposition has been adopted by the House Subcommittee. We certainly urge that the Senate Subcommittee act in a comparable manner. Finally, it is our understanding that there is no objection to this fiscal approach on the part of the Administration.

Senator JOHNSTON. Ms. Friedman is next.

STATEMENT OF CHARLOTTE E. FRIEDMAN, SPECIAL LEGISLATIVE ASSISTANT, AMERICAN ASSOCIATION OF SCHOOL ADMINISTRATORS, ACCOMPANIED BY DR. CALVIN ANDERSON, DIRECTOR OF ENERGY PROJECTS, COLORADO EDUCATION DEPARTMENT

Ms. FRIEDMAN. Mr. Chairman, accompanying me today is Dr. Calvin Anderson. He is director of energy projects for the Colorado Education Department. While he is not making a statement, he would be glad to answer any questions.

The National School Boards Association has addressed many of the concerns of AASA, I think AASA has been invovled in energy projects for some years now. Right now we are engaged in a demonstration project, the first phase of which has been funded by FEA. We have selected 10 schools for retrofitting with cost-effective energy-conserving measures. So we have some experience in that area.

One of the major concerns that AASA has on this bill relates to small schools. They do not have expertise and do not have staff to apply the grantsmanship that larger school districts have. The need technical assistance. The language that now appears in the House bill seems to take care of that problem.

Senator JOHNSTON. I wonder if we should not really make grants to school boards as opposed to schools. What does the bill provide? Can you speak to that?

Ms. FRIEDMAN. I am sorry, I didn't hear the question.

Senator JOHNSTON. The administrator makes the grants to the States to assist schools and hospitals so the individual little schools and little school districts need not have to match their expertise with that of the big school systems.

Ms. FRIEDMAN. If they are not provided some technical assistance to go after the grants, they don't know how to go about it. The larger school districts are aware of grants and applications. Senator Pell's bill has attached to it an application form which we think would be helpful in establishing criteria for funds for the school districts.

Senator JOHNSTON. Shouldn't the State do that?

Ms. FRIEDMAN. I think the State could do it, but we would hope there would be some kind of criteria set up so the small school districts would not be closed out. We feel they need to have some technical assistance. They don't have architects and engineers on their staffs generally, which the larger school districts do.

The personnel who are involved, or would be involved, in energy conservation measures, are also doing other jobs. They just do not have the time or the expertise to fill out the kinds of applications to go after the grants. We feel they need some special attention. Technical assistance provision in the bill would be helpful.

Senator JOHNSTON. Why not have it on a per capita basis? Give it to the States and let the States dole it out to the schools.

Ms. FRIEDMAN. May I ask Dr. Anderson what he thinks about that?

Dr. ANDERSON. I think you are correct. We will find if we don't do it through some centralized approach, we will have reinvention of the wheel in a number of school districts. I think your approach is excellent.

Senator JOHNSTON. We don't have enough money to give everybody everything they want. We don't want to make it dependent on grantmanship. In my State, we divvy up our State's school money, we put a lot of money in the State level. It is done basically on a per capita basis. I think that would probably work out. Would you agree with that, Mr. Davis?

Mr. DAVIS. As long as there is access in the bill to direct grants to school districts through the State agency to avoid administrative burden at the State level. It should be through a State plan but have the capacity like the amended hospital does, to make direct grants to a school district through a State plan without duplicating administrative costs at the State level which we find a problem, frankly, in most Federal programs that do go through State agencies.

Senator JOHNSTON. What I am getting at is granting money to the States on a per capita basis or regional basis. I am not familiar with that formula. I would have to study that. Once it gets to the State, and give it to the school districts based upon a per capita basis and have the State plan provide for the kind of things that can be done with the money.

Mr. DAVIS. Yes, sir. But in the amended House bill there is very brief language that says the State agency must make sure the smaller school districts she is talking about gets some percentage of the money.

Senator JOHNSTON. They would get precisely their share under the per capita basis.

Mr. DAVIS. Once again, you may have some school districts that don't have an energy problem on a per capita basis. As you said earlier, the purpose of this bill is to take care of energy conservation. If you do it on a per capita basis, you will have some school districts that will get money that do not have an energy problem, but those districts that do, large and small should get the money if they have an energy problem.

Senator JOHNSTON. If you go on a district by district basis, they will all have energy problems, more energy problems than we will have money.

Mr. DAVIS. Yes, sir; I will agree with that.

Ms. FRIEDMAN. The other major concern we have was addressed by Mr. Davis. The language in the present bill leaves the schools at the mercy of the Governor. If he does not file a plan or does not file an approved plan, then the schools have no recourse.

We think the language the House adopted would meet those needs.

Senator JOHNSTON. I would invite any comments on the advisability of dividing what the States share on a per capita basis where a State plan would detail permissible uses so the role of the State would be very, very limited.

Mr. DAVIS. We would be glad to respond.

Mr. GEHRIG. We would like to also, Senator. There is a wealth of experience that has been accumulated in this area that provides for State allocation of funding, but the State plan developing a priority which does not necessarily distribute it even within a State but is recommended by the State and granted by the Secretary. We would like to follow up. We think not only is this a good idea but there is a wealth of Federal experience already in this area.

Senator JOHNSTON. Thank you.

[No responses were received for inclusion in the record.]

[The prepared statement of Ms. Friedman and supplemental material follow:]

STATEMENT OF CHARLOTTE FRIEDMAN, SPECIAL LEGISLATIVE ASSISTANT, AMERICAN ASSOCIATION OF SCHOOL ADMINISTRATORS

Mr. Chairman, I am Charlotte Friedman, Legislative Assistant in the Office of Governmental Relations of the American Association of School Administrators (AASA). AASA represents nearly 20,000 school superintendents across the nation. On behalf of them, I would like to express our appreciation for the opportunity to appear before your Committee today to address the energy legislation proposed by the Administration.

Superintendents are the chief school officials at the local district level. They have the responsibility for all operational aspects of our programs—including school plants and budgets. In the two years following the oil embargo, school superintendents saw their fuel costs escalate by 48.3%. In just two years, school fuel costs increased by $514 million dollars—enough money to pay 43,000 teachers at current salaries, or to purchase all the textbooks bought across the nation in a year's time. It is not surprising that, in a survey conducted by AASA in the fall of 1975, superintendents rated energy as their primary concern among federal issues.

Since that time, AASA has worked diligently to assist school administrators to find ways to conserve energy and to bring national attention to the plight of the schools as they face the energy dilemma. From the vantage point of an educational association which assumed an early and active role in the energy area, we commend the President for bringing forth a national energy plan and accompanying legislation for consideration by the Congress.

We further appreciate the increasing evidence that Congress will thoroughly review and weigh the relative merits of this sweeping legislation. We certainly welcome this opportunity to present to you the energy concerns of the schools, particularly as they relate to Part C of the proposed National Energy Act.

Since Part C, Sec. 301, deals specifically with an "Energy Conservation Program for Schools and Hospitals," I would like to direct my comments to that portion of the bill and then to draw in broader considerations as they impinge on implementation of Part C.

We respectfully and urgently request that the Committee consider legislative means of assuring that elementary and secondary schools will, indeed, be served under this legislation. The language of Sec. 304 clearly leaves the schools at the mercy of the Governor. Should the State not request the funds or not submit an approved plan, as required in Sec. 305(b), the local school district has no recourse under the present language—no matter how desperate they are for assistance or how anxious they are to conserve energy.

If the funding must be disbursed through the Governor's office, as provided in this bill, then we urge you to examine the track record for federal assistance *through the States* toward construction in elementary and secondary schools. It is not comforting.

To date, efforts of States to incorporate local school district energy needs into their State energy plans have been spotty and often cursory.

Of the approximately 6 billion square feet in educational facilities, two-thirds are in elementary and secondary plants. However, Federal legislation for educational facilities has highly favored institutions of higher education. State plans which assist higher education facilities to conserve energy wll alleviate mounting energy pressures on that particular portion of their own state budgets. If funds are disbursed on an application basis, the small school districts, and there are many of them, will be no match for the grantsmanship inherent in colleges

and universities. We do not mean to say that institutions of higher education do not need assistance to conserve energy. They do. But the interests of elementary and secondary schools desperately need protection in the language of this bill. Perhaps "equitable consideration" under Sec. 306(b)(6) might be specifically defined as some stipulated apportionment.

Mr. Chairman, I respectfully draw the Committee's attention to the absence of any provisions in Part C which would provide technical assistance to the schools. Of approximately 17,000 school districts in this country, nearly 5,000 (about one-third) have less than 300 students. These small districts simply do not have the staff capability to identify energy needs and to find remedies. The Energy Conservation and Production Act which contains some energy audit provisions does not treat this issue for schools clearly. If the desired energy savings are to be achieved with this limited capital investment, it is critical that the language in Part C recognize the interface between technical assistance and grants.

Under Sec. 391, the "laundry list" to define "energy conservation measure" needs further consideration. In some instances it is too general; in others too specific; and some energy conserving opportunities, such as reducing fenestration, are not noted.

In an effort to provide guidance to school administrators with respect to cost-effective energy conserving measures available to them, AASA last year initiated the Saving Schoolhouse Energy project. "Cost-effective" was defined *very conservatively*. We used a recovery rate of 12 years or less based on 1976 local fuel prices, escalated at 10% per annum and adjusted for capital interest rates. These criteria have enabled us to highlight the ways in which schools can most effectively invest their very limited capital to conserve energy. We found, through computer-assisted engineering analyses at the ten elementary school demonstration sites in our study that a mean expenditure of $25,823 would reduce energy consumption an average 50% across all sites. Again, these expenditure figures are conservative and much can be done to save energy beyond what our study suggests. The Management Summaries for these ten sites are attached for the record.

We now have a clearer indication of *how* energy can be conserved. The difficulty is finding the funds to do it. Part C would help the schools secure some of this desperately needed capital. It is gratifying that the schools' needs are addressed in this bill. Energy concerns of the schools are pervasive and oppressive. The Federal Energy Administration has stated that schools consume 11% of the space heating and cooling energy consumed in this country. Of this, it has been estimated that schools waste 50%. Most schools in use today were built on a first-cost basis when classroom space was critical and energy was not. As a result, the nation and education are paying for those buildings today. Education dollars are going up the chimney in smoke, increasing taxpayers' burdens and denying children educational services they so critically need.

We are convinced that the authorizing level in Part C is not adequate to meet a problem of such great magnitude. It has been indicated that the hospitals will receive approximately one-third of the appropriated funds and that institutions of higher education will get one-third of that which remains. If that is the case, using the costing in our study, and assuming 60% funding, we would be able to do only 5% of the elementary and secondary schools in this nation next year. If *fully funded*, which is highly unlikely, only 8% of the schools would be renovated this coming year.

If we had the best of all worlds . . . IF the elementary and secondary schools received funding proportionate to their square footage of the institutions considered under Part C; i.e., 4 billion square feet of 7.1 billion square feet . . . AND IF the bill were fully funded, the elementary/secondary sector would be able to do 11% of the schools. These optimum conditions are not enough to meet a clear and prevalent need that reaches into every community in the country. Mr. Chairman, this is like trying to put out a roaring inferno with a damp baby blanket. It just won't do the job.

But the schools' energy and financial woes do not end there. Under the provisions of this bill, the schools must pick up the bigger share of the burden, sixty percent. The question has been raised if the schools will be in a position to raise matching dollars.

Matching dollars in most instances have to be raised by a local bonding referendum. Getting the dollars is relatively easy; it is getting the voter authority to borrow the money that is hard. That's why low interest or guaranteed loan programs are usually of little value to the schools. The opportunity to bring

matching federal dollars will add some incentive—50/50 would have been much easier to sell; i.e., "for every local dollar . . . a federal dollar." The need to conserve energy and the cost to be avoided by reducing energy consumption might help sell some of the voters too. But, as every Member of this Committee knows, the mood of the voter is exceedingly hard to predict.

The total effect of the National Energy Act also has implications for school budgets, money to match, and potential passage of school bond issues.

We recognize that the energy situation is both a complex and critical issue and that every sector of the economy must bear part of the burden but our analysis of the total energy package suggests that public schools will be particularly hard hit. Wellhead taxes will raise school fuel costs directly, industrial wellhead and user taxes will hit the schools indirectly in the products they must buy, and general "energy inflation" will pinch the school budget, as well. Unlike other sectors of the economy, public schools cannot incorporate higher fuel taxes in the cost of their product. Public schools cannot even raise tuition or hospital fees as others covered under Sec. 301 can. The public schools have only two choices: raise revenues or cut educational programs. Voter reluctance to raise revenues is well known. It is surely not the intent of the leaders of our Federal government to ask the youth of our country to give up some of their education to assure their future fuel supply.

The financial situation of public schools is further complicated by fiscal barriers; i.e., statutory debt limitations, state and district budget processes, etc. Budgets will probably be set by the time funds are available under this program. The can be adjusted, but it takes time and persuasion.

Can schools raise their share? It will be exceedingly difficult—even more difficult in view of the total energy package.

Unfortunately, those school districts which are in the best position to help themselves will be most likely to find the matching funds to get federal assistance. The rich will get richer and the poor will continue to see education dollars drift away in wisps of smoke.

Children have already been short changed educationally due to the energy situation. Over 40,000,000 pupil-days were lost during the "Winter of 77." Children will be inappropriately placed in the next school year because of the days they missed. Some students will be advanced a grade; some will be held back. Children should not have to pay that price. Jeopardizing even one child's education should not be an additional burden borne of this energy crisis. It should not have happened.

We can ill afford to have it happen again next winter. With a program of school renovation to conserve energy, the same number of BTU's can keep schools open more days next winter. AASA strongly urges you to move forward with the concept proposed in Part C of this bill and to provide the desperately needed financial assistance which schools need to conserve energy. To do less is a waste of human resources as well as energy resources.

Again, Mr. Chairman, thank you for the opportunity to present these views for your consideration. I would be pleased to respond to any questions you or Members of the Committee might have.

Public Schools Energy Conservation Measures

MANAGEMENT

SUMMARIES



AMERICAN ASSOCIATION OF SCHOOL ADMINISTRATORS

SAVING SCHOOLHOUSE ENERGY

The project, Saving Schoolhouse Energy, was initiated to demonstrate the desirability of modifying school buildings to achieve energy conservation, and to develop guidelines by which school administrators could identify the most cost-effective energy conserving opportunities in their buildings.

It should be stressed that the emphasis in this study is on cost-effective capital investments for energy conservation. In this type of study the recommended capital investments should not be implemented without first undertaking a comprehensive operational and maintenance program. This implies that sound energy management procedures, such as appropriate scheduling, periodic inspections, and routine maintenance are a continuing function. It further assumes that the human element--all building personnel and students--is cooperative and appreciative of the intent of the function desired.

The project is designed in five phases: (1) site selection and engineering analyses to identify and recommend cost-effective energy conserving opportunities; (2) architectural and design work; (3) installation, construction, or modifications to implement recommendations; (4) monitoring post-modification energy use to verify the projected energy savings; and (5) dissemination of the findings.

This publication summarizes the PRELIMINARY results of Phase 1. The Federal Energy Administration*, which funded this phase, is in the process of approving the final reports.

PHASE 1 -- MANAGEMENT SUMMARIES

PUBLIC SCHOOL ENERGY CONSERVATION MEASURES, REPORTS #1-10

A thorough and comprehensive engineering analysis of ten representative elementary schools across the nation was undertaken to identify cost-effective energy conserving opportunities. The reports of these studies are designed to provide school administrators, engineers, architects, and associated technical personnel with indicators of potential energy savers in similar buildings. The following information is a brief compilation of these findings and abbreviated management summaries of these ten reports.

The demonstration sites selected were constructed between 1925 and 1973, they were multi-level and single-story, and varied from double-loaded corridors to pod and open space schools; and they were widely dispersed geographically (Figure 1). Six of the schools used natural gas as a fuel source; two used oil; and two had gas/oil option. Fuel costs at the time

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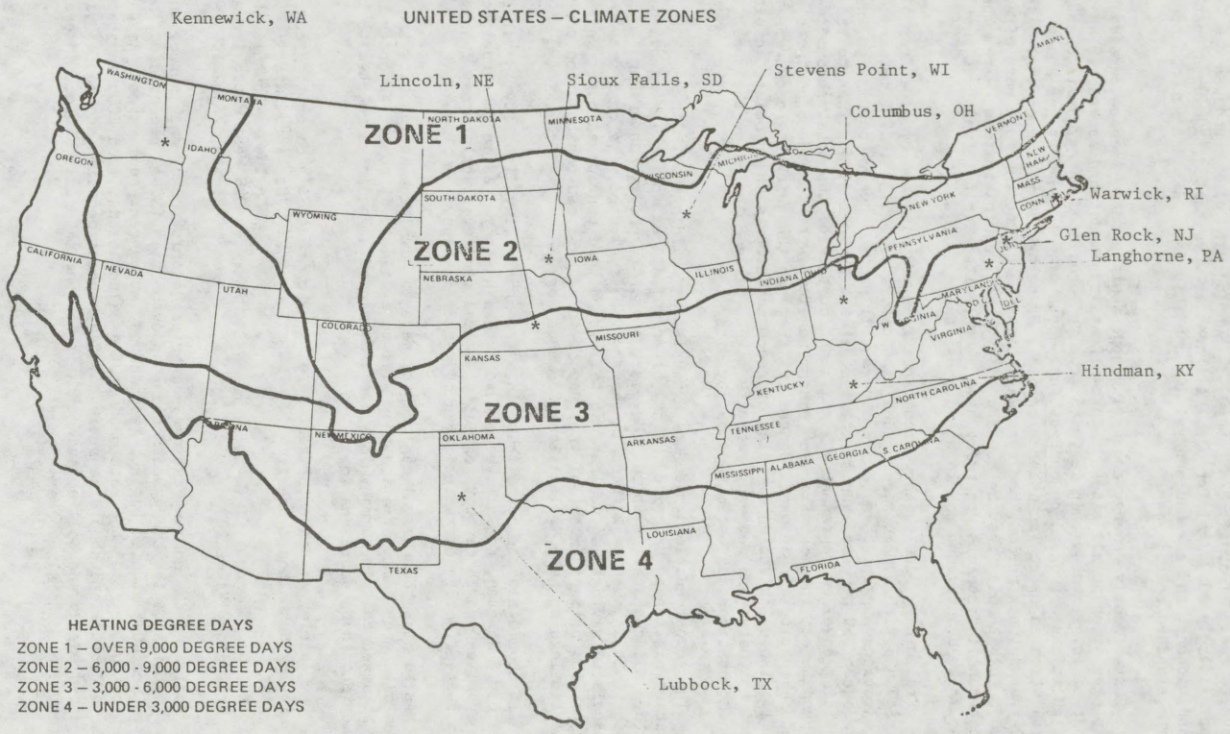
*Federal Energy Administration Contract No. CR-04-60711-00. The views and conclusions contained in this summary and in the engineering reports are those of the authors, and should not be interpreted as necessarily representing the official policies of the U.S. Government.

FIGURE 1. DEMONSTRATION SITES



studied ranged from $1.13/MCF to $3.36/MCF for natural gas and was approximately $0.34/gal for oil. All schools were heated; two used unit air conditioners; and one had central air conditioning. All ten schools operated on a standard school year.

Cost-effective energy conserving opportunities have been recommended for implementation at all sites. "Cost-effective" is defined as recovering the cost of investment within 12 years from the predicted energy savings. Calculations are based on current fuel costs with 10 percent per annum escalation adjusted for interest rates. By using the rather conservative 12-year payback period, the recommendations highlight the most cost-effective ECO's that should first be considered by school administrators -- remembering that school districts generally have very limited capital funds and must seek the most advantageous way to spend those funds.

Preliminary results show recommendations vary in cost by site from $1,000 to $80,425 with a mean recommended expenditure of $25,323. Preliminary projections suggest these expenditures will reduce energy consumption an average of 50 per cent across all ten sites. While modifications to the building envelope represent a significant portion of the total recommended expenditures, the most frequent recommendations were to adjust controls and to reduce outside air intake. Generally, they had the quickest recovery rate as well. Table 1 gives an overview of recommendations with associated capital cost estimates and recovery rates by site. Table 2 indicates the specific recommendations and estimated cost by site.

The recommendations made are for existing buildings with the characteristics as described. They offer guidelines for analyzing buildings with similar characteristics. However, suggested energy conserving opportunities must be weighed in terms of the fuel used, its cost and associated savings, as well as capital expenditure considerations. While it is not the primary intent of this report to address new construction concerns, the findings do have implications for such work.

It should also be noted that, in a free market, availability is reflected in cost. However, fuels have not had such a history. As long as fuel costs or supplies are in any way regulated, actual fuel availability may transcend the cost-effective characteristics of a modification.

As soon as the phase 1 engineering reports have been approved by the Federal Energy Administration they will be available at cost. An order blank is attached to this summary for your convenience. Inquiries related to the study should be addressed to:

Dr. Shirley J. Hansen, Director
Saving Schoolhouse Energy
AASA
1801 No. Moore St.
Arlington, VA 22209

or to AASA's consulting engineer:
JCox Associates
Engineers-Consultants
245 West Maple Avenue
Vienna, VA 22180

Following the summary tables is a brief description of each school and more details on the energy conserving opportunities (ECOs) recommended. Also noted are ECOs studied but not recommended, at current fuel rates. As the cost of fuel exceeds the rate used in the calculations, such ECOs may become cost-effective and should be reviewed. Any reconsideration should not view adjusted energy and dollar savings in isolation; materials, labor, interest rates, etc. must also be assessed.

TABLE 1. Demonstration sites, related information; ECOs, associated cost, and recovery rate.

Report No.	School	Location	Year(s) built/ sq. ft.	Fuel	Cost-effective ECOs	Est. Cost	Recovery rate avg. yrs.
1	Scott	Warwick, R.I.	1965,67/ 27,610 (pod)	gas	1.reduce outside air 2.night setback 3.replace boiler 4.add roof insulation	$ 42,800	7
2	Central	Glen Rock, N.J.	1925,39,50/ 45,384	oil	1.reduce outside air 2.replace boiler 3.chg.temperature settings 4.dampers 5.roof insulation 6.reduce infiltration	39,550	6
3	Everitt	Langhorne, Pa.	1954,58,67/ 49,314	oil	1.reduce outside air 2.replace boiler	21,200	7
4	Hindman	Hindman, Ky.	1957,66/ 32,338	gas	1.increase boiler efficiency 2.reduce glass 60%	13,659	6.3
5	Fairmoor	Columbus, Ohio	1949,55/ 42,765	gas	1.shut down unit vents, summer 2.improve boiler efficiency 3.night setback 4.reduce outside air	25,700	3
6	P.F. Brown	Lubbock, Tex.	1949,50,56/ 36,802	gas	1.update & improve controls	1,000	1.5
7	Eastridge	Lincoln, Neb.	1954,55/ 32,029	gas/ oil	1.reset & rebalance air handling units 2.night setback	10,000	6
8	Garfield	Sioux Falls,N.D.	1952,56/ 33,700	gas/ oil	1.reduce outside air 2.night setback 3.improve boiler efficiency	20,000	8
9	Plover Whiting	Stevens Point, Wisc.	1973/44,000 (open space, CAC)	gas	1.improve air conditioning usage schedule 2.improve indoor lighting schedule 3.air temperature reset 4.reduce outside air	3,900	1
10	Washington	Kennewick, Wash.	1957/40,124	gas	1.mechanical adjustments 2.night setback 3.roof insulation 4.reduce glass 5.replace incandescent lighting	80,425	7.5

TABLE 2. Types of recommendations by site.

Given in cost/recovery rate, in years.

Site	Building Envelope			Lighting	Mechanical (HVAC Systems)						
					Boilers		A.C.	Controls			
	Insulate roof	Reduce glass	Infiltration		Improve efficiency	Replace		Reduce O.A.	Night Setback	Change Temp.	Adjust u.v., dampers, controls
1. Scott	$17,300/ 7					$19,500/9		$6,000/ 5	$0/I* ($1535)		
2. Central	7,200/ 7		$6,000/6 1,350/2 louvers			20,000/6		5,000/ 5		$0/I* ($565)	
3. Everitt						20,000/11		1200/ 2			
4. Hindman		$ 5600/7			←				$ 8,059/5		→
5. Fairmoor					$10,000/3			7200/4	8500/3		Unoc- cupied shut down $0/I* (844)
6. Brown											1000/1.5
7. Eastridge									baseboard radiators 8000/8	2000/4	
8. Garfield					9,000/12			3000/3	8000/8		
9. Plover Whiting				Schedule $0/I* ($3214)			Sched- ule $0/I* (2934)	3000/3		900/6	
10. Washing- ton	35,407/ 11.8	5447/4.2		Replace incandes- cent 29,571/ 9.38							10,000/ 3.08

* I for "immediate return. ( ) gives estimated first year savings.

DEMONSTRATION SITE NO.1: Harold C. Scott Elementary School
Warwick, Rhode Island

Building Characteristics:

1965 single story pod or modified open space school -- 27,610 sq.ft. with library, multipurpose, and administration areas. Walls are 4" face brick, 4" loose insulation, and concrete block with approximately 22% single pane glass. Roof has 2 1/2" insulrock supported by steel beams.

The building is heated by natural draft gas-fired boilers. Unit ventilators are in all classrooms, library, and multipurpose area. Convectors, radiators, and cabinet heaters are used in offices, toilets, and corridors. Gas consumption averages (85 MBTU/sq.ft.)

Illumination is primarily fluorescent. KWH/sq.ft. for all electrical demands averages 3.88.

400 students, K-6; 25 staff. School day: 9:00 a.m.-3:00 p.m. School year: early September-late June.

Total Annual Energy Consumption: 89.6 MBTU/sq.ft. @ 5550 Deg. Days.

Energy Conserving Recommendations:

- Rebalance unit ventilators to reduce outside air 500 cfm to 250 cfm (R.I. code 10 cfm/stu)
  Estimated cost: $6,000. Recovery Rate: less than 5 yrs.
- Revise occupied/unoccupied cycle - from 4:00 a.m.-4:00 p.m. to 8:00 a.m. to 3:00 p.m.; override for night use
  Estimated cost: $0.00. Recovery Rate: immediate. Projected savings 1st year: $1,535
- Replace gas-fired boilers with oil-fired boilers
  Estimated cost: $19,500. Recovery rate: 9 years
- Add roof insulation during re-roofing
  Estimated Cost: $17,300. Recovery rate: 7 years

All recommendations: $42,800 (est.). Recovery: 7 years.

ECOs not recommended warranting future review: double glazing all windows

# # # #

DEMONSTRATION SITE NO. 2: Central Elementary School
Glen Rock, New Jersey

Building Characteristics:

Constructed 1925, 2 levels; 1939, one level addition similar construction. 45,384 sq. ft. Wall is 4" face brick, 2" air, 8" concrete block with plaster interior finish with 35% glass, double hung single pane. Roof is built up roofing over plywood deck; 3' drop in interior ceiling finished with plaster board or acoustical tile.

1958 addition is single level. Wall is 4 "face brick on 8" concrete block with 60% single pane casements. Roof is built up over wood sheathing with air space, 2" insulation and acoustical tile on interior surface.

Heated by (2) 1925 oil-fired low steam boilers (converted from coal). Unit ventilators and radiators in classrooms and auditorium. One pump for original structure and first addition; second pump for '58 addition -- controlled manually. Fuel consumption averages 0.94 gal/sq.ft.(131.6 MBTU/sq.ft.)

Illumination is primarily fluorescent. KWH/sq.ft. for all electrical demands averages 3.5.

300 Students, K-6; 30 staff (includes district administration personnel). School day 9:00 a.m.-3:00 p.m.; staff 8:00 a.m. to 6:00 p.m. School year: early September-late June. 15 adults 8:00 a.m.-6:00 p.m. in July. Vacated in August.

Total Annual Energy Consumption: 158 MBTU/sq.ft. @ 4590 Deg. Days.

Energy Conserving Recommendations:

- Reduce outside air
  --500 cfm to 175 cfm (state code)
  Estimated cost: $5,000. Recovery rate: 5 years
- Replace boiler with modular hot water boilers
  Estimated cost: $20,000. Recovery rate: 6 years.
- Reduce thermostat settings: 70 F to 68 F
  Estimated cost: $0.00 (maintenance). Recovery rate: immediate. Estimated savings 1st year: $565.00
  Install motor operated damper to close louvers and roof ventilators in auditorium
  Estimated cost: $1,350. Recovery rate: 2 years.
- Install roof insulation: -- blanket type in existing 3' airspace. Estimated cost: $7,200. Recovery rate: 7 years.
- Infiltration reductions:
  --weather stripping windows and doors
  --automatic damper at roof ventilator
  Estimated cost: $6,000. Recovery rate: 6 years.

All recommendations: $39,550 (est.). Recovery rate: 6 years

ECOs not recommended warranting future review: institute warm-up cycle with dampers closed.

DEMONSTRATION SITE NO. 3: Samuel Everitt Elementary School
Langhorne, Pennsylvania

Building Characteristics:

Constructed 1954 with two additions (1958, 1967); all have similar structure. 49,314 sq.ft. Walls are 4" face brick, air space, and 8" concrete block with approximately 45% glass in single pane casements. It has a built-up roof over 3 1/2" Insulrock supported by exposed steel beams.

Heated by (2) oil-fired hot water boilers. There is a 5.5 ton air conditioning unit for office area controlled by a 7 day time clock and two manually controlled window air conditioners for the library. Unit ventilators and radiators are used throughout the building. Fuel consumption .68 gals/sq.ft. (93.8 MBTU/sq.ft.).

Illumination is primarily fluorescent. KWH/sq.ft. for all electrical demand averages 3.27.

Everitt has 559 students, K-5. School day: 9:00 a.m. to 3:00 p.m. School year: early September to Mid-June. Used five nights per week and the office all summer.

Total Annual Energy Consumption: 108.9 MBTU/sq.ft. @ 4590 Deg. Days.

Energy Conserving Recommendations:

- Reduce outside air intake
  --500 cfm to 175 cfm (state req.)
  Estimated cost: $1,200. Recovery rate: 2 years.
- Replace boilers with modular hot water boilers
  Estimated cost: $20,000. Recovery rate: 11 years.

All recommendations: $21,200 (est.). Recovery rate: 7 years

ECOs not recommended warranting future review: double pane glass, and/or panel over clearstory glass.

# # # #

DEMONSTRATION SITE NO. 4: Hindman Elementary School
Hindman, Kentucky

Constructed in 1957 with addition of similar structure in 1966. Walls are 4" face brick, 2" air space, and 4" concrete block with 49% glass of 1/8" plate glass with aluminum frame. The roof is 1 1/2" rigid insulation, air space, and 2 3/4" blanket fiberglass on steel deck. Total area is 32,338 sq.ft.

Hindman is heated by a gas-fired cast iron sectional boiler with forced hot water circulating through convectors. Four sections were added in 1966 to accomodate addition. Classrooms do not have thermsotats. Building is controlled by zone of exposure. Annual fuel consumption .8CCF/sq.ft. (80 MBTU/sq.ft.).

Illumination is primarily fluorescent with level at approximately 60 foot-candles. Annual electrical consumption 2.58 KWH/sq.ft.

611 students, 1-7, and 32 staff occupy building from 8:30 a.m. to 3:30 p.m. 180 days, mid-August to mid-May.

Total Annual Fuel Consumption: 88.4 MBTU/sq.ft. @ 3320 Deg. Days.

Energy Conserving Recommendations:

- Increase boiler efficiency to 80%, reduce outside air, and repair zone control
  --clean, adjust boiler; establish appropriate controls
  --set unit ventilators for reduced outside air; close dampers on night set back
  repair and correct zone thermostats and 3-way valves
  Estimated cost: $8,059. Recovery rate: 5 years.
- Reduce glass by 60%.
  Estimated cost: $5,600. Recovery rate: 7 years.

All recommendations: $13,659 (est.). Recovery rate: 6.3 years

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# # # #

DEMONSTRATION SITE NO. 5: Fairmoor Elementary
Columbus, Ohio

Original structure build in 1949 was 23,500 sq.ft. on 3 levels. The walls are 4" brick face on 8" concrete block with 28% glass, N/S facing. Roof was rehabilitated 3 years ago with 2 1/2" insulating board on steel deck.

A 19,200 sq.ft. addition was added in 1955 bringing total square footage to 43,765 sq.ft. The addition is a single level. The walls are 4" brick face on 12" concrete block with 58% glass, E/W facing. The addition roof consists of built up roofing on 2 1/2" Tectum panels with no ceilings.

Fairmoor is heated by 2 gas-fired boilers converted from coal. There are unit ventilators in all classrooms -- steam in original section, hot water in addition. Therms/sq.ft. averages 1.5. (150 MBTU/sq.ft.).

Illumination is primarily fluorescent with mercury vapor and incandescent in multipurpose room. Electricity demand is 3.56 KWR/sq.ft.

475 students, K-6 and 30 staff occupy the building 8:45 a.m. to 3:15 p.m. from early September to mid-June.

Total Annual Energy Consumption: 180.6 MBTU/sq.ft. @ 5280 Deg. Days.

Energy Conserving Recommendations:

- Shut down unit ventilators in unoccupied summer months
  Estimated cost: $0.00. Recovery rate: immediate ($844 1st year)
- Improve boiler efficiency
  --replace burners
  --reduce flue size
  --install boiler controls to fire on demand
  Estimated cost: $10,000. Recovery rate: 4 years.
- Night set back
  --install time clock to shut unit ventilators, close dampers, stop exhaust fans
  Estimated cost: $8,500. Recovery rate: 3 years.
- Adjust unit ventilators to reduce outside air intake
  --air balance; upgrade controls
  Estimated cost: $7,200. Recovery rate: under 4 years.

All recommendations: $25,700 (est.). Recovery rate: under 3 years

---

ECOs not recommended warranting future review: double glazing, insulate addition roof, add double doors, or reduce glass.

# # # #

DEMONSTRATION SITE NO. 6: P. F. Brown
Lubbock, Texas

Original 1949 structure and 1950 addition comprise 25,258 sq.ft. single level. Of similar construction - walls are 4" face brick on 8" structural tile with interior plastered with 16.5% glass, N/S facing. Roof is 3" concrete deck, ceiling plastered.

1956 addition brought total footage to 36,802 sq.ft. This addition is essentially the same with the exception of acoustical board on ceiling and the double hung windows have an E/W orientation.

P. F. Brown has one gas-fired, fire tube, low pressure steam boiler. There are no unit ventilators. Outside air by infiltration only. Gas consumption averages 0.91 MCF/sq.ft. (91 MBTU/sq.ft.).

Illumination is primarily fluorescent. Total electrical demand averages 2.185 KWH/sq.ft

388 students, K-6, and 48 staff occupy the building 8:00 a.m. to 3:00 p.m. late August through May.

Total Annual Energy Consumption: 102.5 MBTU/sq.ft. @ 3150 Deg. Days.

Energy Conserving Recommendations:

- Update and improve controls

Estimated cost: $1,000. Recovery rate: 1.5 years

ECOs not recommended warranting future reveiw: increase efficiency of heating plant.

Adding roof insulation, replacing glass blocks, and contracting weather stripping all had recovery rates over 50 years.

# # # #

DEMONSTRATION SITE NO. 7: Eastridge Elementary School
Lincoln, Nebraska

Constructed in 1954 and added in 1955, Eastridge has essentially the same structure. Walls are 4" brick on 4" cavity block with 4" face brick veneer. Glass is single pane clear and frosted above, 27% of wall with predominance N/S facing. Roof is built up tar and gravel on 3 1/2" cedar deck, 3/4" acoustical tile ceiling.

Eastridge is heated by 2 gas/oil fired hot water boilers. It has hot water baseboard radiators and hot water central air handling units.

Annual fuel consumption: .71 CCF/sq.ft. (71 MBTU/sq.ft.).

Illumination is fluorescent. Annual electric 3.7 KWH/sq.ft.

300 students, K-6, occupy the building from 8:40 a.m. to 2:40 p.m.; 25 staff members from 8:00 a.m.-4:30 p.m. for 178 days each year.

Total Annual Energy Consumption: 83 MBTU/sq.ft. @ 6040 Deg. Days.

Energy Conserving Recommendations:

- Resetting and rebalancing air handling unit
  Estimated cost: $2,000. Recovery rate: 4 years
- Night set back for baseboard radiation
  Estimated Cost: $8,000. Recovery rate: 8 years

Estimated cost: $10,000. Recovery rate: 6 years

ECOs not recommended warranting future review: add roof insulation, reduce glass by 17%, or add exterior wall insulation.

# # # #

DEMONSTRATION SITE NO. 8: Garfield Elementary School
Sioux Falls, South Dakota

Constructed in 1952 and added to in 1956 for a total of 33,700 sq.ft. Garfield has two levels. Walls are 4" face brick on 8" concrete block with about 30% glass. Of this glass area, 70% is glass block and the remainder is plate. The roof is 4 ply pitch and felt, 2" semi-rigid insulation, and 1 1/2" metal deck.

Garfield is heated by 2 gas/oil fired hot water boilers. Hot water baseboards and hot water central air handling units handle the heating and ventilating requirements. Annual fuel consumption: 94 CCF/sq.ft. (94 MBTU/sq.ft.).

Illumination is primarily fluorescent. Annual electric usage 3.08 KWH/sq.ft.

500 students, K-6, occupy the building 8:30 a.m. to 3:15 p.m.; 26 full time and 8 part time staff are there from 8:30 a.m. to 4:00 p.m. for 180 days per year.

Total Annual Energy Consumption: 109.7 MBTU/sq.ft. @ 7860 Deg. Days.

Energy Conserving Recommendations:

- Reduce outside air to minimum code (5 cfm)
  Estimated cost: $3,000. Recovery rate: 3 years
- Night set back system
  Estimated cost: $8,000. Recovery rate: 8 years
- Improve boiler efficiency
  Estimated cost: $9,000. Recovery rate: 12 years

All recommendations: $20,000 (est.). Recovery rate: 8 years

ECOs not recommended warranting future review: add roof insulation, add exterior wall insulation, or reduction of glass.

# # # #

DEMONSTRATION SITE NO. 9: Plover Whiting Elementary School
Stevens Point, Wisconsin

Plover Whiting is an open space school of 44,000 sq.ft. constructed in 1973. It has three distinct wall types: (1) 3/8" diagonal wood siding, 1" rigid insulation, 3/4" air space, and 8" concrete block; (2) as "1" with 12" concrete block around gym; and (3) 3/8" wood siding, 3/8" gypsum sheathing, 2" air space, 3 1/2" batt insulation on 6" stud wall with 5/8" GWB on interior. Glass averages 6.9%. Roof is built up, 1 1/2" rigid insulation, 1 1/2" metal deck, and 3/4" acoustical ceiling tile.

Plover Whiting is heated/cooled by 2 forced draft gas-fired boilers and 120 ton reciprocating chiller with air cooled condensing. Classrooms and multi-purpose are heated, ventilated and air conditioned by 3 central air handling units. Uses average .9 therms/sq.ft. (90 MBTU/sq.ft.).

Illumination is primarily fluorescent. Electrical load demand is approximately 10.5 KWH/sq.ft.

472 students, K-6, and 28 staff occupy the building from 9:00 a.m. to 3:30 p.m. for approximately 180 days, late August to mid-June.

Total Annual Energy Consumption: 132 MBTU/sq.ft. @ 7590 Deg. Days.

Energy Conserving Recommendations:

- Improve air conditioning usage schedule
  Estimated cost: $0.00. Recovery rate: immediate ($2,934 1st year)
- Improve indoor lighting usage schedule
  Estimated cost: $0.00. Recovery rate: immediate ($3,214 1st year)
- Air temperature reset mixed and supply
  Estimated cost: $900. Recovery rate: 6 years
- Reduce outside air intake to minimum code (5 cfm/person)
  --rebalance outside, return, and exhaust dampers
  Estimated cost: $3,000. Recovery rate: 3 years

All recommendations: $3,900 (est.)
Recovery rate (investments only): 2 years
all recommendations: 8 months.

ECOs not recommended warranting future review: add roof insulation and/or add wall insulation.

93-653 O - 78 - 26

DEMONSTRATION SITE NO. 10: Washington Elementary School
Kennewick, Washington

Washington is a single level structure built in 1957 with no addition. The three wing double loaded corridors has a total area of 40,124 sq.ft. Walls are precast panels and 3/4" rigid insulation with 50% glass (1/4" plate). The roof is built up roofing with 2" rigid insulation on steel deck with 2% sky-light.

Heating is by a gas-fired induced draft steel boiler. Distribution is on 3 zones with unit ventilators in classrooms, multipurpose, and administrative areas. Consumption averages .87 therms/sq.ft. (86.9 MBTU/sq.ft.).

Illumination is incandescent throughout. Total electrical demand is approximately 6.14 KWH/sq.ft.

503 students, K-6, occupy the building 9:00 a.m. to 3:15 p.m. and the staff from 8:00 a.m. to 3:45 p.m. from early September to mid-June.

Total Annual Energy Consumption: 107.8 MBTU/sq.ft. @ 5300 Deg. Days.

Energy Conserving Recommendations:

- Mechanical adjustments and maintenance
  --bring outside air up to code (5 cfm)
  --bring pump, filters, coils, fan motors, and damper linkages to maximum efficiency
  --calibrate and reduce thermostat settings
  --provide night setback capability
  Estimated cost: $10,000. Recovery rate: 3.08 years
- Add roof insulation in re-roofing process
  --3" rigid insulation
  Estimated cost: $35,407. Recovery rate: 11.8 years
- Reduce glass by 28% - fixed window modules with N, E or W exposure
  Estimated cost: $5,447. Recovery rate: 4.2 years
- Replace incandescent lighting with fluorescent at code (50 classroom, 20 corridors)
  Estimated cost: $29,571. Recovery rate: 9.38 years

All recommendations: $80,425 Recovery rate: 7.5 years

ECOs not recommended warranting future review: change from gas-fired to electric boiler.

ORDER FORM

Public School Energy Conserving Measures

Report No.

1. SCOTT: *1965,67 pod; replace boilers, add roof insulation, controls ($37,800/5 yr. return)* _____
2. CENTRAL: *1925,39,50; replace boilers, roof insulation, reduce infiltration, controls ($39,550/5 yr. return)* _____
3. EVERITT: *1954,58,67; replace boiler, reduce outside air ($21,200/9 yr. return)* _____
4. HINDMAN: *1957,66; increase boiler efficiency, reduce outside air, night set back, controls, reduce glass 60% ($13,659/6.3 yr. return)* _____
5. FAIRMOOR: *1949,55; improve boiler efficiency, revise unoccupied settings, reduce outside air, night set back ($25,700/3 yrs. return)* _____
6. P.F. BROWN: *1949,50,56; update and improve controls ($1000/1.5 yr. return)* _____
7. EASTRIDGE: *1954,55; reset and rebalance air handling units; night set back ($10,000/5 yr. return)* _____
8. GARFIELD: *1952,56; reduce outside air, night set back, improve boiler efficiency ($20,000/10 yr. return)* _____
9. PLOVER WHITING: *1973; air condition schedule, indoor lighting schedule, air temperature reset, reduce outside air ($3,900/1 yr. return)* _____
10. WASHINGTON: *mechanical adjustments, night set back, roof insulation, reduce glass, replace incandescent lighting ($80,425/7.5 yr. return)* _____

No. Reports Requested _____

Each report at cost ($2.50) including postage and handling as soon as cleared by Federal Energy Administration.

Enclosed is $_____(# reports X $2.50)

Make check payable to AASA-Energy and mail to:

Dr. Shirley J. Hansen
AASA-OGR
1801 North Moore Street
Arlington, VA. 22209

AASA

American Association of School Administrators

July 12, 1977

The Honorable J. Bennett Johnston
Chairman, Subcommittee on Energy
Conservation & Regulation
Dirksen Senate Office Building
Washington, D.C. 20510

Dear Senator Johnston:

At the June 22 hearing of the Senate Committee on Energy and Natural Resources, you invited supplementary comments on Part C of S. 1469, the National Energy Act, specifically with respect to the advisability of dividing the funds authorized under Part C on a per capita basis.

As we indicated in testimony at the public hearing, one of AASA's primary concerns is to assure that the energy conservation needs of small school districts are met. We recognize that there are a number of mechanisms by which this end could be achieved, including allocation of funds on a per pupil basis. However, we believe that a program of technical assistance and appropriate criteria for ranking applications would more adequately meet those needs.

In this connection, I respectfully call to your attention the technical assistance provisions in S.701. That program is designed to assist educational institutions in handling the technical problems necessary to deal with energy use and conservation. It would support projects which concentrate on efficient management of energy use. Technical assistance in adjusting operational and maintenance procedures can reduce energy consumption by 30%.

I am enclosing copy of a proposed application form (both for basic grants and for technical assistance) and some proposed criteria for ranking applications for funding. These were developed in consultation with school administrators, architects, engineers, and associated technical people who are familiar with problems encountered in school buildings, and we believe they would be helpful in implementing the proposed legislation.

I would also like to take this opportunity to emphasize two other points made in our earlier testimony.

We respectfully request that the Committee reexamine the language dealing with distribution of funds, as well as the funding levels, in Part C of S. 1469. We would urge that language similar to that in S.701 be

included so that schools would not be denied financial assistance in states where funds had not been requested or where the state plan had not been approved. We urge the Committee's consideration of funding levels such as those proposed in S.701. Part C, funded at 60%, would afford, at best, 2-3% of the schools an opportunity to modify their buildings to conserve energy. Considering the dimension of the problem, this is totally inadequate.

We appreciate the opportunity to supplement our views on legislation so vital to educational institutions.

Sincerely,

Charlotte E. Friedman

Charlotte E. Friedman
Legislative Assistant

Enclosure

CEF/thd

Proposed Grant Application Form (S701) - Basic Grants

APPLICATION FOR FEDERAL ASSISTANCE ENERGY CONSERVATION - BASIC GRANTS	Date Prepared 2. CODING 3. CODING
1. State Grantor Agency administrative unit street address city state zip code	4. Applicant school district, department, division street address city county state zip code

5. Demonstrated energy need. Reason:

a) high energy costs . . . . . a) $ / unit of fuel

b) energy shortage . . . . . b) documentation
reduced allocation
school closing due to energy shortage

c) unusually harsh and persistent adverse weather conditions . . . c) Degree days (July 1, 1976-June 30, 1977)
Other conditions (explain):

6. Name, address (grant building(s))

7. General description of proposed Energy Conserving Investments (in rank order):

Conservation Measures	Approximate Cost
a.	$
b.	
c.	
d.	
e. Planning, engineering, legal fees	
f. Total (Sum lines a-e)	

FEDERAL REQUEST
Federal Share (50% of line f) $

8. Types of fuel(s) saved:

9. BTU saved/year (July 1, 1972-June 30, 1973):

10. Cost/BTU (July 1, 1976-June 30, 1977):

2nd fuel, if applicable

11. Cost avoided/year: $ (1976-77 price)

Authenticated by

Authorized by

Proposed Grant Application Form (S701) Page 2

12. Energy data

A. FUEL USED July 1, 1972 - June 30, 1973

Type	KWH, Tons, Gal., CCF	Factor	BTU x 10^3	%	Cost	Cost/ BTU
oil	_____gals	138 #2 oil 145 #4 oil 148 #5 oil 150 #6 oil			/gal	
gas	_____CCF	1			/CCF	
coal	_____tons	25,400 anthracite 21,000 western 21,600 bituminous			/ton	
elec	_____KWH	3.41			/KWH	
other						
TOTAL				100%		

B. FUEL USED July 1, 1976 - June 30, 1977

Type	KWH, Tons, Gal., CCF	Factor	BTU x 10^3	%	Cost	Cost/ BTU
oil	_____gals	138 #2 oil 145 #4 oil 148 #5 oil 150 #6 oil			/gal	
gas	_____CCF	1			/CCF	
coal	_____tons	25,400 anthracite 21,000 western 21,600 bituminous			/ton	
elec	_____KWH	3.41			/KWH	
other						
TOTAL				100%		

13. Sq. ft. of total building floor(s) _____

14. Degree days (July 1, 1976 - June 30, 1977) _____

15. BTU/sq. ft. (July 1, 1972 - June 30, 1973) _____ (grant building only)

BTU/sq. ft. (July 1, 1976 - June 30, 1977) _____ (grant building only)

16. Aggregate calculated BTU/sq. ft./year to be saved by modifications (over July 1, 1976 - June 30, 1977 figure):

_____ BTU/sq. ft./year

17. Amortization of investment cost:

a. Estimated cost of modifications $_____

b. Calculated avoided cost

1976-77 price: _____ (BTU saved) x _____ (1976-77 cost/BTU) = $_____

$_____ 2nd fuel, if applicable

c. Cost avoidance table

76-77 Base Cost avoided	YEAR	FACTOR 20% Increase Compounded Annually	Cost Avoided	Cumulatitive Total
(17b)	1977-78	1.20		
	1978-79	1.44		
	1979-80	1.69		
	1980-81	2,03		*

*If last cumulative total above does not exceed or equal the investment cost of the modifications, show number of years required for amortization of the investment (attach calculations) _____ years.

18. Matching funds

Local Share (50% of estimated energy conserving measures, line 7)

$_____

Proposed method of financing local share

Source(s) of funding	Amount
1.	$
2.	$
3.	$
4.	$
TOTAL	$

Pending matching funds: (explain) _____

_____ $_____

19. General description of the project.
Describe each energy conserving measure to be taken on a form identical to attached "Form B." Also include or attach calculations supporting quantitative information on Form B.

20. Identify authenticating authority and attach qualifications information: _____

_____

21. Describe method of evaluating the effectiveness of the modification: _____

_____

_____

22. Are state approval procedures required for proposed energy conservation measures?

yes no If yes, indicate status of approval: _____

_____

23. The applicant certifies that to the best of his/her knowledge and belief, the data in this application are true and correct, and that he/she will comply with the attached assurances if the grant is awarded.

_____
signature

_____ _____
name (print) title

_____ _____
organization's name phone number

Application form will also require:

Completed assurances, e.g. all legal requirements; sharing information with private schools

Instructions, including a completed sample form

APPLICATION FOR FEDERAL ASSISTANCE

Energy Conservation -- Basic Grants

Form B

Existing building characteristics: give building age; provide only those aspects of building envelop, heating, ventilating & air conditioning, plant & systems, lighting usage, etc. pertinent to the energy conservation measure described below

_____

_____

_____

General description of energy conservation measure : _____

_____

_____

_____

_____

_____

_____

_____

_____

Estimated cost $ _____

BTU saved/year _____

Type of fuel saved _____

Cost/BTU _____ (1976-77 price)

Cost avoided/year _____ (1976-77 price)

Authenticated by _____
signature

Proposed Grant Application Form (S701) -- Technical Assistance

APPLICATION FOR FEDERAL ASSISTANCE ENERGY CONSERVATION -- TECHNICAL ASSISTANCE	Date Prepared 2. CODING 3. CODING
1. Federal Grantor Agency	4. Applicant
administrative unit	school district, department, division
street address	street address
city state zip code	city county state zip code

5. Demonstrated energy need. Reason:

a) high energy costs . . . . . a) $ _____ / _____ unit of fuel

b) energy shortage . . . . . b) document
reduced allocation
school closing due to energy shortage

c) unusually harsh and persistent adverse weather conditions . . . . . c) Degree days _____ (July 1, 1976-June 30, 1977)
Other conditions (explain): _____

Relief is sought due to: (Explanation)

_____

6. Name and address of building(s) for which application is made: _____

_____

7. Building(s) description: give building age; additions; roof and wall structure; heating, ventilating and air conditioning plants and distribution systems; lighting, usage for each building by name. _____

_____

_____

_____

_____

8. Projection justification: Factors contributing to need for Technical Assistance grant:

_____

_____

_____

9. Approximate cost (attach calculations) $_____

10. FEDERAL REQUEST
Federal Share (50%) $_____

11. Energy data

A. FUEL USED July 1, 1972 - June 30, 1973

Type	KWH, Tons, Gal., CCF	Factor	BTU x 10^3	%	Cost	Cost/ BTU
oil	_____gals	138 #2 oil 145 #4 oil 148 #5 oil 150 #6 oil			/gal	
gas	_____CCF	1			/CCF	
coal	_____tons	25,400 anthracite 21,000 western 21,600 bituminous			/ton	
elec	_____KWH	3.41			/KWH	
other						
TOTAL				100%		

B. FUEL USED July 1, 1976 - June 30, 1977

Type	KWH, Tons, Gal., CCF	Factor	BTU x 10^3	%	Cost	Cost/ BTU
oil	_____gals	138 #2 oil 145 #4 oil 148 #5 oil 150 #6 oil			/gal	
gas	_____CCF	1			/CCF	
coal	_____tons	25,400 anthracite 21,000 western 21,600 bituminous			/ton	
elec	_____KWH	3.41			/KWH	
other						
TOTAL				100%		

12. Sq. ft. of total building floor(s) _____

13. Degree days (July 1, 1976 - June 30, 1977) _____

14. BTU/sq. ft. (July 1, 1972 - June 30, 1973) _____ by grant buildings

15. BTU/sq. ft. (July 1, 1976 - June 30, 1977) _____ by grant buildings

16. BTU/sq. ft./degree day _____ for July 1, 1976 - June 30, 1977

17. Proposed method of financing local share

Sources(s) of funding	Amount
1.	$
2.	$
3.	$
4.	$
TOTAL	$

Pending matching funds: (explain) _____

_____ $_____

18. Other factors contributing to need for Technical Assistance grant (optional)

_____

_____

_____

_____

19. Identify proposed source(s) of Technical Assistance. Attach qualifications information. _____

_____

_____

20. The applicant certifies that to the best of his/her knowledge and belief, the data in this application are true and correct, and that he/she will comply with the attached assurances if the grant is awarded.

_____
signature

_____ _____
name (print) title

_____ _____
organization's name phone number

Application form will also require:

Completed assurances, e.g. all legal requirements; sharing information with private schools

Instructions, including a completed sample form

PROPOSED CRITERIA FOR RANKING APPLICATIONS FOR FUNDING UNDER EMERGENCY EDUCATIONAL ASSISTANCE ACT (S701)

I. BASIC GRANTS:

A. Eligibility requirements:

1. Type of agency "educational institution":
   a) local educational agency
   b) institution of higher education

2. Energy conservation need:
   a) high cost of energy
   b) energy shortage
   c) unusually harsh and persistent adverse weather conditions

3. Local matching funds

4. State approval as required

5. Assurances are met

B. Application criteria (100 pts.):

1. Potential energy savings . . . . . 30 pts.

2. Recovery rate (number of years cost avoidance will amortize capital invested). 10

3. Operational measures already taken (comparison of 1976-77 fuel consumption to baseline 1972-73 consumption) 15

4. Type of fuel saved. 5

5. Supply capabilities for fuel (Limited availability documented) 20

6. Energy audit quality 5

7. Climatic concerns 5

8. Proposed evaluation procedures 5

9. Cost of fuel saved 5

II. TECHNICAL ASSISTANCE:

A. Eligibility requirements:

1. Type of agency:
   a) local education agencies
   b) institutions of higher education
   c) state educational agencies
   d) state energy offices
   e) other appropriate state agencies
   f) consortium of any of above

2. Energy conservation need:
   a) high cost of energy
   b) energy shortage
   c) unusually harsh and persistent adverse weather conditions

3. Local matching funds

4. Assurances

B. Application criteria (100 pts):

1. Energy conservation need (BTU/sq. ft.) . . . . . 30 pts.

2. Operational conservation measures already undertaken (relate 1972-73 to 1976-77 consumption) 15

3. Type of fuel 5

4. Fuel supply capabilities 20

5. Qualifications of technical assistance 5

6. Climatic concerns 5

7. Statement of technical assistance need and nature of need 15

8. Cost of fuel 5

Draft applications and criteria
submitted by:
Ad Hoc Committee on Energy/Education Legislation
March 11, 1977

Revised
March 18, 1977

Senator JOHNSTON. Mr. Saunders.

STATEMENT OF CHARLES B. SAUNDERS, JR., DIRECTOR OF GOVERNMENTAL RELATIONS, AMERICAN COUNCIL ON EDUCATION

Mr. SAUNDERS. Thank you, Mr. Chairman. I am speaking this morning on behalf of 10 higher education associations identified on page 5 of my statement. I would like to extend to this subcommittee on behalf of the higher education community the assistance and expertise of our energy task force which we put together 3 years ago in a cooperative way with the various higher education associations staffed largely by the National Association of College and University Business Officers and the Association of Physical Plant Administrators.

Over the last 2 to 3 years the energy task force has been providing important technical assistance showing institutions how to conserve energy, taking surveys to identify the extent of the need. It's latest product is this report, "Energy Costs and Energy Conservation Programs in Colleges and Universities: 1972–73 and 1974–75."

I have provided copies for the members of the committee. If you will, Mr. Chairman, I would like to ask that the two-page summary of the highlights of that study be inserted in the record along with my formal statement.[1]

Senator JOHNSTON. Without objection. Please identify that so we will know what to put in.

Mr. SAUNDER. I would like to say, touching on the question of the prohibition against participation of private institutions, as the administration bill is written, this is something that is of major concern to us.

As you have already heard, we understand the administration has already agreed that the kind of language developed in the House subcommittee bill to resolve this problem is acceptable.

In answer to the last question you raised on the question of funding the money through the States, I think you have to be very careful to differentiate. It is one thing to allocate the money through the States. If the money goes directly and legally to the States, then again we have the same situation: In about 25 States, there would be constitutional or other prohibitions against private institutions using that money or obtaining funds from the State.

We suggest in our testimony language such as has been used in the Hill-Burton Hospital Construction Act or the Higher Education Facilities Act, which make grants directly to institutions which meet the requirements of State plans.

Senator JOHNSTON. What would be the State plan?

Mr. SAUNDERS. The State would identify the priorities and the requirements for application and would pass along, in effect, to the Federal Government any applications which met those requirements.

Senator JOHNSTON. Suppose you divided up the money to States, let's say the State of Louisiana, how is 5 percent of the pie, and you divide that up on a per capita basis? By the way, would the State allocation and the per capita basis be the fair way to do it?

Mr. SAUNDERS. I don't think it would. That would not take into consideration the overbearing geographical requirements for energy,

[1] The material referred to appears in appendix III, pgs. 584–85.

unless there were factored in some method of dealing with differing energy needs in different parts of the country.

Senator JOHNSTON. What would you factor in that?

Mr. SAUNDERS. It could be on the basis of a regional proportion of total national energy consumption or something of that sort.

Senator JOHNSTON. Suppose we divided it up by State on a regional energy consumption factor, that factored in, and same as we did if Louisiana gets x dollars, but of those x dollars, you made the Federal grants directly not to the schools, we are talking about schools now, we can take Mr. Davis' 80 or 85 percent or 30 percent or whatever the percent is, and we have it, say for enough schools in Louisiana a number of dollars and we give it to the school board, or in the case of the Catholics, the archdiocese or whatever, the highest—and let them spend it.

The State plan, but say what you could dispense it on, identify priorities.

Mr. SAUNDERS. I think that would be an effective way of doing it. I think as long as it is clear there is no problem with private or independent institutions——

Senator JOHNSTON. I think that would be only to avoid that private thing, but also would be fair. I share your concern about grantsmanship. We should not have to go through all of that and have all of that wasted time and expense. The school board, archdiocese, or whatever, ought to be able to say we have x dollars, we have got to manage that with x dollars but we can spend that on however we want to identify our own problems.

Mr. SAUNDERS. That would be a fair way of doing it.

If I can make a couple of more points, I would like to note the definitions in the administration bill. They are too narrow to include some of the important energy conservation measures. Our energy task force has developed some amended definitions which are appended in my testimony.

We are happy to say these definitions have, for the most part, been accepted in the version of the bill being drafted in the House Energy and Power Subcommittee.

Senator JOHNSTON. Suppose we identify with a very broad brush what can be done and then let the States come up with a more specifically identified list of things that can be done, a list of things that can be done in my part of the country as opposed to New Hampshire.

Mr. SAUNDERS. This would be comparable to the administration approach. They have developed language in the House which is acceptable to all parties and does provide the flexibility to assure different parts of the country can meet their own needs.

Senator JOHNSTON. The House language is broad enough for everybody?

Mr. SAUNDERS. I think the House language is acceptable.

Finally, the other point which has been made before, but I would like to underline again, is simply the totality, the magnitude of the whole problem. Our estimate of need for higher education is on the order of $4 billion to make the existing facilities in colleges and universities around the country energy efficient.

That is not doing anything exotic, that is just taking the normal steps.

Senator JOHNSTON. That is total need?

Mr. SAUNDERS. For higher education alone. We feel as opposed to the $300 million a year, or a total of $900 million worth of grant assistance provided in the administration bill, a much more realistic assistance is authorized in Senator Pell's bill, S. 701, before this subcommittee. We also feel as the school administrators have already testified, the technical assistance provision of Senator Pell's bill is very important.

That technical assistance provision has been embodied in the House bill. We support that provision, and we support the scope of the funding that Senator Pell's bill would provide on the order of $500 million a year for 5 years for a total of $2.5 billion for education alone.

I want to note that Senator Pell's bill just deals with elementary and secondary schools problems and the colleges and does not meet the needs of the hospitals which, as you have already heard, are enormous.

The proposed authorization in the administration bill, I would like to say for higher education as well as the other sectors, only begins to scratch the surface. For that reason we in the education community do support the magnitude of assistance provided in S. 701, as well as the specific technical assistance provision in that bill.

I would also like to add, Mr. Chairman, that I recognize the tax provisions of the administration's energy proposals are not at issue before this committee, but I would like to note in passing, the way the administration proposals work, the nonprofit sector, the Nation's schools, hospitals, colleges and museums, et cetera, are excluded from eligibility for the tax rebate and refund provisions. This requires the nonprofit sector to bear the major share or a disproportionate share of the costs of the President's energy program because the nonprofit sector along with the other sectors would pay the special taxes on energy consumption imposed in title II, but it would not share in the relief granted to business and industry, to State and local governments, and to private individuals in the form of tax rebates, refunds, and other economies.

We feel this is a serious defect too.

Senator JOHNSTON. I want to thank the panel. I hope we have covered most of the points. We will read the statements very carefully. I invite you to supplement by letter anything you would like to say.

Mr. DAVIS. I have one comment I must make in view of your comment. I didn't know if your question was directed to the panel or Mr. Saunders and that is when you said was the language in the House subcommittee bill is acceptable. Mr. Saunders replied affirmatively and looked around the panel.

Schools have some reservations about the language in the subcommittee bill. When you take out the sectarian instruction and replace religious definition of worship in schools, as you well understand because of your background, we have reservations about that as an aid to education and separation of church and State in the educational matters.

Senator JOHNSTON. We are not trying to get into that. We are not trying to aid religion or breach the first amendment.

Mr. DAVIS. I just want to make sure you understand schools have reservations about the language in the House subcommittee bill. I did not want you to think the panel agreed.

Senator JOHNSTON. We are trying to save the Nation's energy not propogate any particular religion.

[The prepared statement of Mr. Saunders follows:]

STATEMENT OF CHARLES B. SAUNDERS, JR., DIRECTOR OF GOVERNMENTAL RELATIONS, AMERICAN COUNCIL ON EDUCATION

I appreciate the opportunity to comment on the Administration's proposed Energy Conservation Program for Schools and Hospitals, on behalf of ten higher education associations.

The Administration's proposal (Part C of Title I of S. 1469, the National Energy Act) recognizes two important points which have received relatively little attention in the debate on national energy policy in recent years:

1. The nonprofit sector (especially the education community) comprises a significant and energy-intensive sector of the American economy, accounting for about 10 percent of the nation's total energy consumption. Therefore the nonprofit sector is a major potential source for energy savings.

2. The nation's energy problems have an enormous impact on schools and colleges throughout the country. Sharply rising energy costs pose a very real danger to the educational system, by robbing financially hard-pressed institutions of funds vitally needed to sustain and improve the quality of educational services for the American people. For postsecondary education alone, total energy costs rose from $555 million in academic year 1972–73 (FY 73) to $944 million in academic 1974–75 (FY 75)—an increase of 70 percent. This increase fell mosst heavily on the East (where college energy costs rose 94 perecnt) and the South (84 percent), but also significantly affected institutions in the Midwest (48 percent) and the West (40 percent). Nationally, institutional current fund expenditures for energy rose from 2.7 percent to 3.6 percent, even while increased conservation efforts resulted in a 12 percent decrease in energy consumption.

We welcome the recognition of these points in Part C of Title I which would make matching federal funds for energy conservation projects available to schools, colleges, and hospitals. At the same time, we are seriously concerned that the nonprofit sector is inexplicably excluded from eligibility for the tax rebate and refund provisions in Title II of the bill.

Although the nonprofit sector would pay, with other sectors of the economy, the special taxes on energy consumption imposed in Title II, it would not share in the relief granted to business and industry, state and local governments, and private individuals in the form of tax rebates, refunds, and credits for fuel efficiency and for economies in the use of energy for business and residential purposes.

Thus the burden of the proposed taxes would fall disproportionately on the nonprofit sector. This is particularly unfair because colleges and universities, unlike business and regulated industries, cannot readily pass on increased energy costs directly to their "customers," since these customers are students and their parents who are already suffering heavy financial pressures due to rising educational costs. It should also be noted that, to the extent colleges are forced to pass on their increased energy costs by raising their tuition and fees, this will generate needs for further increases in federal student assistance programs which already total $8 billion.

With respect to the specifics of Title I Part C, several changes are essential to provide effective and equitable incentives for energy conservation:

1. There is a serious problem with the language of Sections 303, 305 and 306 which provide that grants shall be made to the states for allocation to recipients of approved projects. This procedure presents an abstacle to the participation of private schools and colleges in about 25 states which have constitutional prohibitions against the use of state funds for private or sectarian institutions.

There are models for resolving this problem in the language of existing federal laws, such as the Hill-Burton Hospital Construction Act and the Higher Education Facilities Act, which provide federal grants directly to recipient institutions which meet the requirements of state plans. We urge that similar language be adopted in appropriate amendments to Part C so that public and

private institutions will continue to be treated alike, as Congress has consistently determined in all legislation dealing with postsecondary education.

2. The definitions of allowable energy conservation measures in Section 301 needs to be broadened to encourage systems convert and co-generation of energy. Systems convert is the most sophisticated and costly type of conservation measure, but it yields substantial energy savings. Co-generation—the production of other forms of energy in addition to electricity, such as steam or heat—vastly increases the capacity and efficiency of existing power plants.

The definition of furnace modifications in 391(2)(F) is so restrictive as to exclude major renovation to a central power plant. Such modifications are essential for energy conservation programs at large-scale institutions where campus power plants serve multiple buildings (over 60 universities have enrollments ranging from 20,000 to 58,000 students).

Furthermore, since 45 percent of the energy consumed in colleges and universities is driven by natural gas, the scarcest fuel, conservation programs should not only be permitted but encouraged to convert power plants to other sources of energy. Such conversion would apparently not be allowable under 391(2)(F). Neither would co-generation of energy, which is encouraged in other parts of the legislation. It makes no sense to incur major costs for plant conversion unless at the same time co-generation is undertaken wherever feasible. Otherwise institutions would be locked into the same burn capacity as before, with less efficient fuels, and without the added benefits of co-generation which typically increases plant efficiency from 35 to 75 percent.

The definitions also seem to exclude heat recovery systems, heat pumps, and other devices for substantially increasing energy efficiency. Our Energy Task Force has prepared amended definitions which would assure that the most important and effective energy conservation measures will be eligible for funding. These amendments are attached as an Appendix to our testimony.

3. The authorization for energy conservation projects would only make a token start on meeting identified needs in the education sector. The $900 million authorized over three years would produce $2.25 billion worth of reconversion at 40 percent federal matching. We estimate that a systematic effort to improve the energy efficiency of higher education facilities alone would cost $4 billion. However, such an effort would have the potential of annual energy savings of between $400 and $500 million—the equivalent of the entire annual energy consumption of the aluminum industry. Therefore we feel that a higher authorization for the grant program and more generous (50–50) federal matching would provide a more realistic index of the level of national commitment which is needed.

We also suggest an additional authority for technical assistance as desirable to encourage utilization studies and other important planning activities. We commend to your attention the language of Section 8 of S. 701, sponsored by Senator Pell, which authorizes $150 million annually for grants to state agencies, local educational agencies, and institutions of higher education to pay the federal share of the cost of technical assistance for energy conservation measures. Such an authority would result in more intelligent energy conservation and greater energy efficiency.

Thank you for the opportunity to present these views, on behalf of the American Association of Community and Junior Colleges, the American Association of State Colleges and Universities, the American Council on Education, the Association of American Universities, the Association of Jesuit Colleges and Universities, the Association of Physical Plant Administrators, the National Association of College and University Business Officers, the National Association of Independent Colleges and Universities, the National Association of State Universities and Land-Grant Colleges, and the National Catholic Educational Association's College and University Department.

Appendix

Proposed Amendments to Definitions of Energy Conservation Measures (P. 28, Committee Print No. 1)

"Sec. 391. (2) The term 'energy conservation measure' means an installation or modification of an installation which reduces energy consumption or allows the use of a more desirable energy source, including—

"(1) insulation of mechanical systems and the building structure;

"(2) additional glazing, reductions in glass area, reflective glass coatings, and other window modifications;

"(3) automatic energy control systems;

"(4) solar heating and/or cooling systems;

"(5) solar water heating systems;

"(6) furnace or utility plant and distribution system modifications including—

"(A) replacement burners designed to reduce the firing rate or to achieve a reduction in the amount of fuel consumed as a result of increased combustion efficiency,

"(B) devices for modifying flue openings which will increase the efficiency of the heating system, and

"(C) electrical or mechanical furnace ignition systems modification including replacement of standing gas pilot lights;

"(D) utility plant systems conversion measures including conversion of existing oil and gas fired boiler installations to alternative energy sources, including coal;

"(7) caulking and weatherstripping;

"(8) lighting fixture retrofits, to the extent that such retrofit reduces the watts per square foot level for illumination and does not increase the general illumination level of the facility *provided that*, an increase in the general illumination level of the facility will be permitted if the administrator finds that the level of illumination in such facility prior to retrofit was less than is generally available in similar facilities;

"(9) energy and heat recovery and distribution system modifications from sources such as ventilation systems, laundry exhaust systems, boiler stacks, heat pump, and solid waste incineration;

"(10) such other energy conservation measures as the administrator may, from time to time, by rule, determine appropriate."

Senator JOHNSTON. Thank you all very much. The hearing is adjourned.

[Whereupon, at 10:15 a.m., the hearing was adjourned.]

APPENDIXES

Answers From Witnesses to Questions Submitted by Subcommittee

Answers Received From Federal Energy Administration

Q.1. Provide the Committee with a timetable showing the schedule for completion of the test procedures and development of the efficiency targets for each of the 13 types of appliances identified in the Energy Policy and Conservation Act.

A. The following is our timetable for completion of appliance test procedures and targets:

Test Procedures	Proposed	Final
Dishwashers	issued	8/2/77
Clothes dryers	issued	9/8/77
Water heaters	issued	9/8/77
Home heating equipment--nonvented	issued	9/15/77
Televisions	issued	9/8/77
Refrigerators and refrigerator-freezers	issued	9/8/77
Freezers	issued	9/8/77
Clothes washers	issued	9/22/77
Humidifiers and dehumidifiers	issued	10/10/77
Kitchen ranges and ovens	issued	10/24/77
Central air conditioners	issued	11/1/77
Furnaces	7/28/77	12/14/77
Home heating equipment--vented	8/22/77	12/20/77

Targets	Proposed	Final
Products (1)-(10)*	issued	11/29/77
Humidifiers and dehumidifiers	8/4/77	12/22/77
Central air conditioners	8/4/77	12/22/77
Furnaces	9/23/77	12/22/77

* Refrigerators and refrigerator-freezers, freezers, dishwashers, clothes dryers, water heaters, room air conditioners, home heating equipment (nonvented), television sets, kitchen ranges and ovens, and clothes washers.

Q.2. How many mandatory State appliance efficiency standards can reasonably be expected to become effective prior to development of efficiency targets by FEA? Which appliance types and which States?

A. The only State that will have a State appliance standard in effect before our targets are issued (November 29, 1977, for products 1-10 and December 22, 1977, for the other products) is California. Their minimum efficiency standards for room and central air conditioners, refrigerators, freezers and refrigerator-freezers are scheduled to be implemented on November 3, 1977.

Q.3. What is the average cost to the Federal Government for weatherization of homes of low-income persons, including costs of labor and materials? What is the variation around this average?

A. The average cost to the Federal Government of weatherizing low-income homes including both materials and labor costs is approximately $420. We anticipate that materials and labor costs will be about equal, so the average for each category is estimated at $210. FEA materials expenditures are limited by statute to $400 per dwelling unit unless the State Policy Advisory Council, established for this program, provides for a greater amount with respect to specific categories of units or materials. The amount spent per dwelling unit could be as little as $50 if the only application is caulking and weatherstripping. FEA expects that the cost per dwelling unit may be expected to run in the range from $100 to $800 for weatherization projects throughout the country, although reliable data will only be available after the program has begun.

Q.4. What is the Administration's position concerning a mandatory requirement that residential property be insulated at time of sale? Should commercial property be included under such a requirement? Why or why not? Would the Administration favor mandatory disclosure of energy consumption data at sale of residential or commercial property?

A. Various mandatory measures for the residential sector were considered as the National Energy Plan was developed. One such measure which was carefully analyzed was a requirement that homes meet Federal insulation standards either as a condition of sale or as a condition of refinancing at time of sale. This requirement would involve substantial administrative and inspection costs by government and banks, and may be a significant burden on certain economic groups. Time-of-sale requirements could help guarantee the achievement of the goals for residential conservation which are important to our overall Plan. We decided in April not to include this mandatory provision, and we continue to believe that a voluntary program such as that which we have proposed can succeed. As stated in the National Energy Plan, we will consider such mandatory proposals if we find that a voluntary program is inadequate.

A mandatory requirement for commercial building energy efficiency at time of sale would be more difficult to implement. Regulations would have to be developed for many different types of buildings including those which are more complex in their construction and their energy systems. Simple measures such as ceiling insulation and storm windows save substantial energy in residential buildings, but in many commercial buildings the most effective measures are those which affect heating and cooling systems. Development of standards for each category of commercial building would be complex, though draft standards for some types have already been developed by the private sector. The legal mechanisms would also be different for many commercial buildings. One method for retrofitting of single family residences to comply with a Federal energy efficiency standard is to require Federally chartered or insured lending institutions to certify compliance prior to issuance of a mortgage. Many apartment and commercial buildings are financed, however, by lenders not regulated by the Federal Government, such as mortgage companies and insurance companies.

We have also considered requiring mandatory disclosure of energy costs at time of sale. We believe that the advantages of such a requirement, in the form of increased awareness and interest in energy conservation by home buyers, are outweighed by the burdensome administrative mechanisms which would be required for enforcement. Banks or realtors would have to verify that fuel bills were accurate; utilities would have to be reimbursed for their costs in assembling the data; and it is not clear how to get the data to the buyer prior to contract or otherwise so that it would be used by the buyer before he is legally obligated to purchase the home. We encourage home buyers to look at energy costs in considering a home and are encouraged that many lenders are considering energy efficiency in assessing both a home's value and an individual's eligibility for a loan.

Q.5. Provide the Committee with the best analysis available to FEA concerning the price, supply and demand for insulation to residential and commercial consumers by year for the period 1970-1985.

A. The answer to this question is divided into three parts: (1) supply; (2) demand; (3) prices. Each of these will be discussed.

Supply of Insulation: Conclusions about supply are to a large extent dependent on the competitiveness of the insulation market and the number of homes that could potentially be retrofitted over the timeframe in question.

Generally, there are three major types of insulation used in residential retrofits and new homes today: (1) fiber glass; (2) slag wool (also known as rock wool); (3) cellulose. Cellulose is seldom used in new homes; it is primarily a retrofit item.

The production of fiber glass insulation is highly concentrated. Three firms completely dominate the market. The production of slag wool is also highly concentrated; eight companies produce slag wool. One company has approximately 45 percent of the market and 4 companies have approximately 85-90 percent of the

market. There are 200-300 producers of cellulose. Perhaps 20 companies have 50 percent of the market and 40 companies have 75 percent of the market.

At the distributing and retail levels, the insulation market is more competitive. There are national distributors, direct retail outlets, Co-ops, independent wholesalers, contractors and literally thousands of independent dealers.

Entry into the fiber glass market is difficult. Entry into the slag wool and cellulose market is relatively easy. The technology for fiber glass is complex and capital-intensive; therefore, it is very expensive to enter the market. The industry estimates that addition of a line in an existing plant can be accomplished within 18 months. A wholly new facility may take as much as 36 months to complete.

The technology necessary to produce slag wool insulation is neither sophisticated nor difficult to obtain. Basic patents have expired and the price tag for a plant capable of generating up to $6 million per year in revenue is under $8 million. An existing slag wool plant can be expanded in 12-18 months and a new plant brought on line in 2 years.

Cellulosic insulation material is produced by combining shredded and milled waste paper with fire-retardant chemicals. Low capital investment on the order of $2 million is required to set up operations. Adding to an existing plant could take 6-9 months while a new plant could be in production within 12-18 months.

Questions have been raised as to whether or not cellulose is competitive with fiber glass or slag wool in terms of quality or price. FEA, ERDA and NBS are currently analyzing the effectiveness of cellulose as an insulating material. These agencies are endeavoring to develop material standards under which cellulose would be most effective.

If in fact cellulose is comparable to mineral wool (the generic name for fiber glass and rock wool) in terms of quality and costs, the insulation industry is very competitive; there would be many suppliers of insulation rather than a few. If there are shortages of mineral wool, cellulose can be used as a substitute. There will be much price competition within the industry in the long run.

There is more uncertainty in the short run. The speed at which the insulation industry can and will increase

capacity to supply the increasing demands for insulation is a difficult issue. A recent report done by ICF for FEA, "Supply Response to Residential Insulation Retrofit Demand" presented the following information:

- All insulation producers are undertaking or planning capacity increases. Total shipments of fiber glass structural insulation in 1976 was 1.4 billion pounds. Owens-Corning Fiberglass (OCF) has current plans to increase structural insulation capacity from 1.33 billion pounds in 1977 to about 2.1 billion pounds in 1984, an increase of 57 percent. Johns-Manville is planning to double its insulation capacity over the next 4 years. CertainTeed is building a new plant which should be on-line in late 1978 or early 1979. The total fiber glass structural insulation capacity is 2.1 billion pounds today and should increase to approximately 3.2 billion pounds by 1980.

- Capacity increases are planned for rock wool and cellulose insulation also. A number of these firms are building new plants or adding new lines to existing plants. A large rock wool manufacturer is adding two new lines to existing plants which will begin production in 1977. Many cellulose firms are also expanding existing plants

at a very rapid rate. The structural insulation market (fiber glass, rock wool and cellulose) is expected to increase from 3.5 billion pounds in 1977 to 5.2 billion pounds in 1980.

- Insulation demand arises in two primary sectors: industrial equipment and pipes, and building construction. The latter category can be further divided into commercial/industrial construction, new residential construction and reinsulation and remodelling. The estimated demand for industrial equipment, commercial/industrial building, and new residential construction has been subtracted from estimated capacity to show how much insulation material could be available for retrofit. The following table indicates how many homes could be retrofitted assuming two scenarios: (1) an "average" level of retrofit per home (equivalent to R-19) and (2) a "high" level of retrofit per home (equivalent to R-25). The HUD minimum standard for new homes for most of the country is R-19.

TOTAL NUMBER OF HOMES
(Millions)

	Average	High
1977	4.6	2.8
1978	7.1	4.2
1979	8.5	5.0
1980	9.0	5.3

- The above figures are likely to be conservative since relatively low levels of increase in the rate of growth of cellulose production have been assumed. Preliminary data from the Department of Commerce survey indicate that large increases in the capacity of the cellulose industry are anticipated.

- To some extent, the machinery that manufactures structural insulation can be modified to produce insulation for the residential sector or the industrial/commercial sector. It is estimated that one-third of the production capacity is interchangeable--residential versus industrial/commercial. The demand for insulation in the industrial/commercial sector is usually estimated in terms of the dollar value on nonresidential construction. Up until the recession in 1975, the value of nonresidential construction was increasing slightly more than 8 1/2 percent per year. The ICF report indicates that the capacity for producing structural insulation for the industrial/ commercial market will increase from .6

billion pounds in 1977 to .77 billion pounds in 1980, an increase of almost 30 percent.

Demand for Insulation: It is difficult to estimate the projected demand for insulation with or without the tax credit. Two million seven hundred thousand homes were retrofitted in each of the last 3 years according to an OCF survey. Insulation sales have been particularly strong this year. The rate of reinsulation was at 1.2 million homes during the first quarter of 1977, compared with 350,000 in the comparable quarter in 1976. Current new housing starts, including manufactured housing shipments, are at an annualized rate of well over 2 million--the strongest level since 1972 and 1973, and the average amount of insulation per new housing unit continues to increase. During the first 5 months of 1977, Owens-Corning delivered 60 percent more residential insulation than in the same period last year. Despite this increased overall output, their loose fill insulation is currently in short supply in some parts of the country.

It is believed that the primary reason for the increased demand for insulation is the recent very cold winter and high fuel bills. Most homes in the country could

cost-effectively invest in some level of insulation. It is extremely difficult to determine with any degree of precision how many of the homes will demand insulation as a result of the tax credit immediately after the legislation is passed and how many homes will be willing to wait as the utility program is phased in.

Pricing

Information on the price-setting strategies of a corporation is perhaps the most difficult data to obtain: for obvious reasons, the coporation wants to maintain confidentiality in the timing and amount of price increases. Pricing in the insulation industry is further complicated by the high concentration that exists in fiberglass manufacturing. The few firms and the fact that fiberglass insulation effectively sets the prices for rock wool and cellulosic insulation suggests that industry prices depend importantly upon the three large fiberglass producers-and most importantly, upon the pricing behavior of the market leader Owens-Corning.

The wholesale price index provides a convenient, although somewhat inexact, method of comparing price increases to

the general trend in the economy. Figure 1 compares the wholesale price index for insulating materials to that for all industrial commodities. In 1970, the insulation materials index was 12 percent higher than that of all commodities. This rose to 15.4 percent in 1971, a year of greatly increased housing starts, and remained relatively steady in the peak housing year of 1972. As is shown in the figure, only in 1974, perhaps due to price controls, does the relationship between the two indices change. In 1976, insulating materials again exceeds all commodities by about 16.5 percent. Overall, the insulation material price index increased by 61.2 percent from 1971 to 1976, while the wholesale price index for all industrial commodities increased by 59.8 percent.

Figure 2 shows the index of housing starts in 1967 and the wholesale price indexes for insulation materials and for all construction materials. Again it is clear that changes in the index for insulation materials are most closely related to changes in the index for construction materials and appear to be unrelated to the index of housing starts.

These comparisons would seem to indicate that prices are set independently of short-term demand/supply considerations; the major component of price setting in the industry appear

FIGURE 1. COMPARISON OF WHOLESALE PRICE INDEX FOR ALL INSULATION MATERIALS TO ALL INDUSTRIAL COMMODITIES

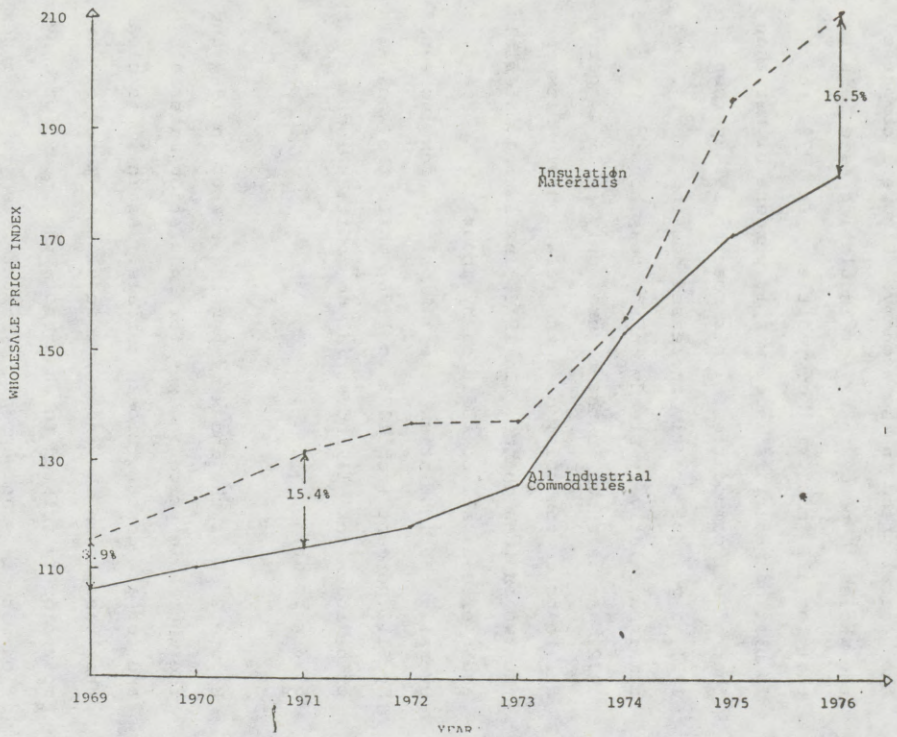
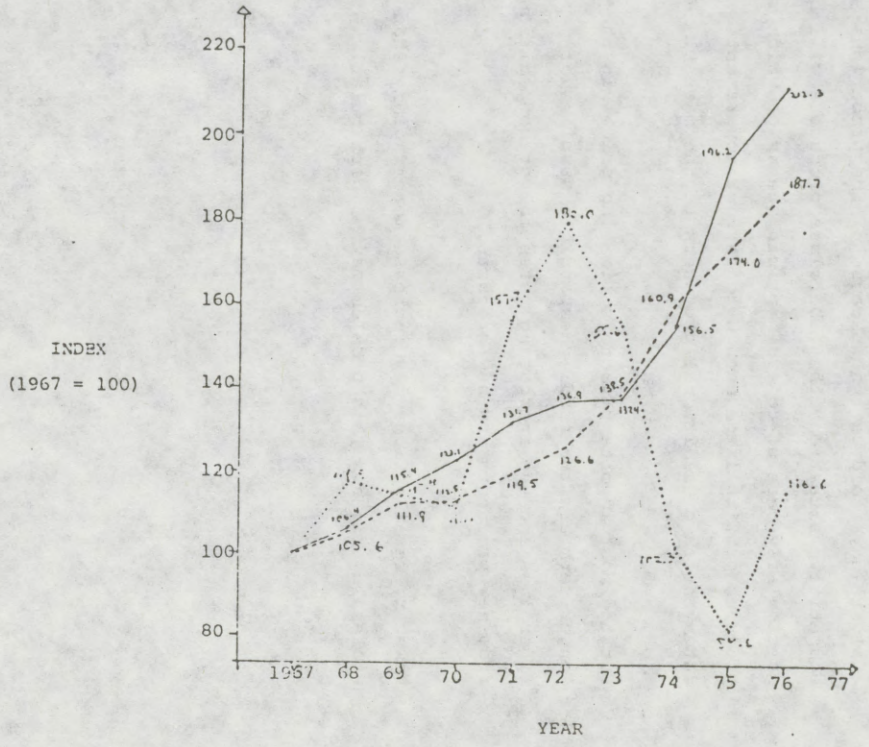


Figure 2. COMPARISON OF MOVEMENTS IN HOUSING STARTS AND WHOLESALE PRICES FOR INSULATION MATERIALS



to be increase in costs of basic materials, energy, and wages. For the past 2 years, price increases have paralleled increases in raw material costs. In previous periods of sharply increased demand such as 1971-1972 and 1974-1975, price increases also followed increases in the wholesale price index.

Although the industry structure suggests that there may be a dominant price leader with the potential to raise prices in a shortage, there is no evidence of this occurring in the past. On the contrary, outside industry analysts have told us that because of the precarious competitive situation, the fiberglass producers will be particularly careful to avoid pricing behavior which produces profits large enough to attract government intervention or additional producers to the market.

But the most important factors limiting prices in the longer-term are the readily expandible supplies of fiberglass and the increasing potential of competition from new producers and new products.

However, retail prices may increase more rapidly than wholesale prices. This problem may be particularly

acute in the short run as industry is still adjusting their productive capacity and local shortages may develop. FEA has asked the Council on Wage and Price Stability to pursue this matter.

SUMMARY

If cellulose is an effective substitute for mineral wool, there will not be a shortage of insulation and thus little potential for excessive price increases after 1978. The insulation market will be very competitive at the wholesale and retail level.

However, over the next 6 months to 1 year, there could be shortages of and/or retail price increases for insulation as the industry is still in the process of increasing production capacity. Such shortages will only occur, however, if there is a strong immediate increase in demand (on the order of a doubling) over insulation retrofit levels of last year.

Q.6. List the major utilities which presently offer energy conservation or solar energy services to their customers. What arrangements for energy audits, financing and installation are part of each utility conservation program? What interest is charged on loaned money? What is the rate of return on the investment in the program for the utility?

A. ERDA and FEA are compiling under contract a summary of insulation programs run by utilities and a more detailed study of the operation of four or five of these programs. This information will be available in two phases, the first in August and the second later this year. Information available now has been supplied by the American Gas Association (AGA) and through conversations with individual utilities. We have attached (1) material developed in 1976 for an FEA utility conservation program; and (2) a three page summary of a survey conducted in March of this year by AGA.

As this material shows, utility programs vary greatly with respect to audits, financing, and installation. Some utilities offer free home inspections; others merely send out information. Some utilities have

established their own profit-oriented insulation subsidies; others merely refer customers to other contractors. Nearly all utilities with a program will finance installation of insulation, most offering up to 3-year payback terms. Interest rates vary from 9-18 percent per year and are typically 12 percent.

We do not have information on the rates of return earned by utilities on these programs. We do not yet know whether most utilities are simply allowed to cover expenses through small additions to rates, or whether many rate commissions allow utilities to earn a profit on some portion of their costs.

Under the National Energy Act, as contained in S. 1469, utility rate commissions would retain the ability to determine how utility costs are recovered. Interest rates on loans and prices charged for services would be subject to FEA review and would have to be "fair and reasonable" (Section 102(d)(4)).

Utility Finance Plan

Company	Consolidated Edison Co. of New York
Territory	City of New York and Westchester County, N.Y.
Contact	Richard Arcari, Mgr. Commercial Services Robert Stevens, Executive Director, Com'l. Se (212) 460-5221
Status	Begun in Spetember 1976; projection of 20,000 to 30,000 impacted homes for first year (Of 2.9 million customers)
Utility Role and Motivation	Energy Conservation Direct mail and employee incentive promotions Contractors field leads, provide estimates and take orders including Con. Ed. financing. Available to gas
Source of Funds	Internal
Credit Approval and Collection	Internal; Separate Installment Billing Delinquent Payment Charge $5
Loan Limit	$150 to $800; 3 year limit
Average Loan	$500
Interest Rate	1% per month on Unpaid Balance
Products	Ceiling insulation, Automatic thermostates, attic fans
Contractors or Installers	Participating contractors. Each lead given three contractors for competitive bids
Certification and Inspection	Company will inspect within five days all jobs at first, then will go on a sampling basis
Regulatory Commission	Company filed a plan, a formal docket was established and a formal ruling was made by N.Y.P.S.C. approving
State Banking Commission	Filed and received certificate - Arcari is "Loan Officer"
Oil Heat Customers	No

Source: FEA conversations with utility

Utility Finance Plan

Company	Brooklyn Union Gas Company
Territory	Part or all of three boroughs in New York City
Contact	Al Jennings, Energy Conservation program leader (212) 643-3884
Status	Active program, which grow out of the continuing marketing programs of the past 25 years
Utility Role and Motivation	Direct inspection of insulation needs and a grant, or subsidy, provide to the homeowner who installs insulation. Grant equals up to 25% of total installation cost, but does not exceed $100 per home.
Source of Funds	N.A.
Credit Approval and Collection	Arranged by Homeowner
Loan Limit	N.A.
Average Loan	N.A.
Interest Rate	N.A.
Products	Insulation only
Contractors or Installers	Arranged by Homeowner
Certification and Inspection	None
Regulatory Commission	No formal role.
State Banking Commission	N.A.

Source: FEA conversations with utility

Utility Finance Plan

Company	Washington Natural Gas Co.
Territory	Western Washington
Contact	Don Navarre, V.P., Rod Nelson, Staff Asst. to Don Navarre, (206) 622-6767
Status	Extension of long standing merchandise finance plant to include energy conserving products; 2500 to 3000 jobs have been completed.
Utility Role and Motivation	Internal sales force
Source of Funds	Internal
Credit Approval and Collection	Internal; Installments Billed Separately
Loan Limit	Minimum Payment $5/month; Maximum Period 5 years
Average Loan	$185-$385
Interest Rate	12% annual rate on unpaid balance
Products	Insulation, Storm Door and Window, Thermostats, Electric Ignition replacing pilots of furnaces, furnaces replacing oversized and inefficient furnaces
Contractors or Installers	Certified installer - contractor program
Certification and Inspection	Quality control program with random inspection
Regulatory Commission	No control over merchandising and financing
State Banking Commission	No involvement

Source: FEA conversations with utility

Utility Finance Plan

Company	Pacific Gas and Electric Company
Territory	Northern and Central California
Contact	Joseph DeYoung, Vice President - Commercial Oper. (415) 781-4211
Status	Planning Stage, Targeted to Start January 1, 1977
Utility Role and Motivation	Financing, media advertising, training, some direct selling, liaison with the trade. Desire to increase annual home insulations from 52,000 in 1975 and 65,000 in 1976 with lower cost financing.
Source of Funds	Internal
Credit Approval Billing and Collection	Internal Credit - Separate Bills from gas and electricity
Loan Limit	$800 Maximum
Average Loan	$300
Interest Rate	Prime rate + 2% (or less)
Products	Ceiling insulation and caulking (storm windows and doors not used in California) (includes do-it-yourself materials)
Contractors of Installers	Member of Insulation Division of Electric and Gas Industry Association of Northern and Central California who subscribe to their code of ethics. Includes Manufacturers Wholesalers, Retailers, Contractors, Installers and the Utility
Certification and Inspection	Installers certified by the Association and Inspection will be by P. G. & E. on a spot or sampling basis
Regulatory Commission	No formal role, but are pleased with the program
State Banking Commission	No regulation other than legislated maximum finance charges

Source: FEA conversations with utility

Utility Finance Plan

Company	Southern California Edison Co.
Territory	Southern California except City of Los Angel
Contact	Robert Roberson, Conservation Manager (213) 572-1212
Status	N.A. Inactive finance subsidiary may originate a Finance Plan for Solar in 1977
Utility Role	Small insulation installation program since April 1976. No financing, as such.
Source of Funds	N.A.
Credit Approval and Collection	N.A.
Loan Limit	N.A.
Average Loan	N.A.
Interest Rate	90 day Interest-Free Program, also. Bank Americard and Master-charge
Products	Insulation - Only areas where no Southern California Gas Co. Solar Equipment Late in '76 or Early '77
Contractors	Company pakes orders, subcontracts to state licensed contractors
Certification and Inspection	Final Inspection - Spot Checks only
Regulatory Commission	P.S.C. had strongly urged insulation program. Watches progress.
State Banking Commission	N.A.

Source: FEA conversations with utility

Utility Finance Plan

Company	Southern California Gas Co.
Territory	Southern California
Contact	Messrs. Andre, McMurray and Nemick
Status	In force for 18 months; 19,000 homes affect to date (of 3 million residential customers)
Utility Role	Utility field forces determine insulation needs, provide contractor list for customer selection
Source of Funds	Internal
Credit Approval	Internal - Billed separately from gas service
Loan Limit	No maximum
Average Loan	$300
Interest Rate	1 1/2% per month on unpaid balance
Products	Insulation
Contractors or Installers	Certified or approved contractor list Retailer stock equipment for do-it-yourself
Certification and Inspection	Company inspects all completed work
Regulatory Commission	Approved the Program
State Banking Commission	No regulation - Banks were disinterested

Source: FEA conversations with utility

AMERICAN GAS ASSOCIATION MARCH 22, 1977

1977 THERMAL RETROFIT SURVEY
(Percent of 130 Responses)

1. Do you sell and subcontract any of the following retrofit services?

   23% Yes 77% No

   If yes, please check those that apply. If no, go to question 9.

   100% Attic insulation
   53% Wall insulation
   13% Storm doors & windows
   10% Caulking & weatherstripping
   63% Clock thermostats

2. Are these retrofit services offered to (check one):

   40% Your customers only?

   60% All homeowners in your service area?

3. Do you arrange for financing or finance such work checked in (1) above?

   73% Yes 27% No

4. Do you guarantee the subcontractor work checked in (1) above?

   82% Yes 18% No

5. Is your retrofit marketing service organized (check one):

   67% for profit (outside of rate base)? 33% for non-profit?

6. Do you maintain a sales force? 90% Yes 10% No
   If yes, how many? Average 13.5 people -- Range 1-90.

7. Is your sales force trained to estimate the cost of installing (check those that apply):

   87% Attic Insulation
   53% Wall Insulation
   13% Storm Doors & Windows
   7% Caulking & Weatherstripping
   43% Clock Thermostats
   27% Others as noted in (1)

8. What communications media do you use to reach prospective retrofit homeowners (check those that apply)?

   87% Bill stuffer
   14% Truck poster
   70% Newspaper ads
   50% Radio
   23% TV
   33% Other

Source: Amercian Gas Association

9. Is your company planning to sell and subcontract retrofit services during the remainder of this year or during 1978? (Base 130 companies)

43% Yes 57% No

If yes, what retrofit services are you planning to sell and subcontract?

100% Attic insulation
46% Wall insulation
22% Storm doors & windows
22% Caulking & weatherstripping
65% Clock thermostats
32% Other

10. Is your state regulatory entity or energy office urging utilities to become involved in (check those that apply): (Base 130 companies)

Marketing insulation - 34%
Financing insulation - 33%
Other - 18%

11. If you are currently selling retrofit services or are interested in this business, would you send a representative(s) to a two day, A.G.A. sponsored seminar on utility retrofit services in Chicago during May 1977? (Base 130 companies)

53% Yes

If yes, how many? 69 companies

If yes, what subjects would you like to have covered (check those that apply)? (Base 69 companies)

45% Marketing attic insulation
34% Marketing wall insulation
27% Marketing storm doors & windows
33% Marketing other energy conserving products
22% Sales training
25% Financing
36% Products available to improve thermal efficiency
42% Products available to reduce energy consumption
32% NBS or ERDA research on insulation
34% Review of FEA's "full service" retrofit manual for contractors
1% Other

Source: Amercian Gas Association

12. In your current conservation communications, are you urging customers to install: (Check those that apply) (Base 130 companies)

a.

94%	Attic insulation	53%	Clock thermostat
79%	Wall insulation	31%	Attic ventilators
80%	Storm doors & windows	19%	Sun shades & awnings
84%	Caulking & weatherstripping	38%	Humidifiers
15%	Other	22%	Water restrictors

b. Do you provide names of subcontractors on request? (Base 130 companies)

39% Yes 61% No

Q.7. Describe the state of the industry composed of insulation contractors. How many businesses of this kind are there? Are they generally small businesses?

A. Retrofit contracting is one service provided by a segment of the remodeling industry. Based on mailing lists of the two major trade publications (Home Improvement Contractor Magazine and Qualified Remodeler) we estimate that there are approximately 25,000 to 30,000 full-time remodeling contractors. These include kitchen remodelers, HVAC contractors, roofing and siding contractors, insulation installers, etc. In addition to this group, there are at least again as many small part-time contractors specializing in subcategories such as retrofit. Homebuilders may also be interested in retrofitting houses they have previously sold.

Because retrofit contracting is often a small operation, and because there is no one umbrella trade organization which meets the needs of the retrofit contractor, it is difficult to estimate with any accuracy the number of firms engaged in this business. A recent national survey by Owens-Corning Fiberglass, based on telephone

yellow pages and Dunn and Bradstreet lists, concluded that there were about 2000 residential insulation contractors.

A recent survey of home improvement contractors in the Washington, D.C. area, however, showed that approximately 50 percent of them were involved to some degree in installing insulation. If we can assume that this is characteristic of the entire industry, then it would appear there are approximately 12,000-15,000 contractors involved in retrofit of all types.

Q.8. What are the energy savings estimated for the vanpool and solar energy demonstration programs proposed by the President? What is the cost of the energy equivalent of a barrel of oil saved for each of these programs? How, if at all, should the Federal agencies be encouraged to make investments in improvements in energy efficiency?

A. The energy savings estimates for the Federal Employee Vanpool Program are as follows:

1978	1979	1980	1981 and beyond
375/BPD	750/BPD	1125/BPD	1500/BPD

Costs per barrel saved estimates can only be calculated for programs which have a net cost. Since there are no net costs associated with the Federal Vanpool Program in that it is structured to pay for itself, no cost per barrel estimate for this initiative was or can be made. We estimate that the total savings--both direct and indirect--as a result of the Federal solar heating and cooling program through 1985 is .01 quads. This estimate does not provide sufficient detail to calculate cost per barrel saved. Energy conservation in all Federal facilities and operations is considered essential by the Administration, both as a means of reducing the energy costs of the Federal Government and as a demonstration to nonfederal energy users of our commitment

to the adoption of a comprehensive conservation program. Federal agencies have already achieved a 25 percent reduction in the use of energy through the adoption of a wide range of low-cost conservation measures. There remains, however, the potential for significantly greater energy savings through investments in selected energy conservation measures.

Section 381 of the Energy Policy and Conservation Act specifically directs the development of a 10-year plan for energy conservation in Federal buildings. The National Energy Act would amend this section in order to specifically cover all Executive Agencies as defined in Section 105 of Title 5, United States Code, including the United States Postal Service and to authorize, in addition to the authorizations in any other law, the appropriation of such sums as may be necessary to carry out this program. These amendments, in conjunction with an Executive Order to be issued shortly by the President, will ensure that all Executive Agencies which own and maintain buildings will develop and implement programs to improve the energy efficiency of Federal buildings. These efforts are not a small undertaking. For example, although it is impossible to estimate accurately the costs of completely refurbishing existing Federal buildings, we have estimated that such a program could cost about

$2.67 billion. The cumulative savings resulting from such conservation actions in both new and existing buildings, however, is likely to exceed $4 billion by 1990. Clearly, the ultimate energy and dollar savings that would result argue strongly for such programs.

Q.9. What studies (if any) does FEA have under way to identify opportunities for further energy conservation

- in the utility sector?
- in the industrial sector?
- in the transportation sector?
- in nonfuel (i.e.--petrochemical) use of energy resources?

What do you expect to do as a result of these studies? When will they be completed?

A. In the utility sector, FEA has two major efforts ongoing: The Electric Utility Rate Design Proposals study (copies of the interim report have been sent to the Committee) and the Utility Rate Design Demonstration projects. In addition, FEA has been working with the Electric Power Research Institute (EPRI) and other on their Electric Utility Rate Design Study.

The FEA Electric Utility Rate Design Proposals study is scheduled to be completed by January 15, 1978. The interim report, which was completed in March, presented basic information on the industry and alternative rate designs.

The Utility Rate Design Demonstration projects are attempting to study the various methods that can be used to implement alternative rate designs and load management techniques. FEA's 16 demonstrations will be completed over the next 2 years. Each demonstration will add additional facts to our knowledge of the problems and potential achievements obtainable by modifying electric utility rates.

FEA personnel are also members of joint task forces for a combined study with EPRI and others of various electric rate design questions. These studies are being completed issue by issue and are attempting to provide a broad range of viewpoints on important rate design questions.

In the industrial sector, FEA and ERDA have recently completed several studies in the area of industrial equipment efficiencies and the potential for improvement. Specifically, electric motors, pumps and steam boilers have been analyzed as to energy consumption, potential for energy conservation and possible areas for Federal initiatives to encourage improvements. This information indicates that considerable energy savings are technically and economically feasible.

In the transportation sector, FEA is currently engaged in an inhouse analysis of the various travel modes' characteristics and energy use, and of individuals' and organizations' travel demand and behavior as it relates to transportation. We also have an outside transportation study (to be completed in December 1977) to develop an Urban Transportation Manual to provide information on policies and programs to reduce urban transportation energy. The study will include case studies and methodologies for policy and program assessments. In addition, we have the following transportation studies underway:

1. Fuel Efficiency Activities of Aircraft and Air Carriers to identify fuel efficient policies and practices applicable to aircraft operations and to determine the extent to which these procedures have been implemented by the carriers. Final report due September 1977.

2. A Study to Effect Modal Shifts in Short-haul Passenger Travel to identify and evaluate strategies for influencing modal selection so as to achieve greater use of fuel-efficient modes for short haul passenger travel. Final report is due September 1977.

3. Comparative Fuel Consumption by Competitive Modes in Intermodal Freight Service Demonstration. An element of a 3-year intermodal freight service demonstration being sponsored by the Federal Railroad Administration, this FEA study is to collect and analyze fuel consumption data to determine the relative efficiencies of truck and rail modes for various types of freight movements.

4. Vanpool Workshop Program. One result of this workshop program will be to develop a better understanding of the employment site characteristics which are conducive to vanpooling, a better estimate of the potential, and a clearer determination of which legal and institutional barriers to vanpooling warrant corrective action by Federal, State and local government.

FEA has no program aimed specifically at reducing non-fuel (feedstock) use of energy resources. Scattered data on the amount of energy utilized for feedstocks does exist, and a few papers have been developed which touch on reducing the amount of scarce energy sources required for this purpose. An FEA contractor has

developed, for the Energy Resource Development Office, a paper on the production of ammonia from coal rather than natural gas.

ERDA has begun or is contemplating a number of specific research programs directed at using resources other than oil or gas for feedstocks. These are:

1. Waste carbon monoxide as a chemical feedstock.

2. Production of acetylene from coal.

3. Conversion of polypropylene wastes to fuel oil and feedstocks.

4. Use of rubber tires as feedstocks.

Q.10. What opportunities exist to authorize (or direct) that existing mortgage or home improvement loans be opened to permit the addition of loans for energy conservation investments? Why were initiatives such as these not included in the National Energy Plan?

A. Two opportunities exist to authorize (or direct) existing mortgages or home improvement loans to be opened to permit the addition of loans for energy conservation investments. Open ended mortgages contain a provision which allows the amount of the loan to be increased, where the additional amount is usually financed at the currently prevailing rates. All Federally chartered savings and loan institutions can write such mortgages where allowable by State law. In addition, HUD Title I home improvement loans can be opened to provide financing for energy conservation retrofits.

This provision was not included in the National Energy Plan for several reasons. Each opportunity for opening mortgages is limited in terms of coverage. For example, open ended mortgages are allowed only in about 30-35 States and are actively used in about half of these States. In 1975, the HUD Title I program only insured

about 3.5 percent of the $25.2 billion expenditures for home improvements, in that year. Further, there are administrative and institutional impediments which were recognized during the development of the National Energy Plan. State usury laws could preclude the charging of currently prevailing long-term rates. Searches for intervening liens will also be necessary to assure the current loan is clear. Commercial bankers have expressed concern that purchasing installment loans for home improvements from contractors may create additional liability for the financial institutions and erode their financial security because of possible anticipated modifications, by statute or court decision, to the "Holder in Due Course" doctrine as applied to home improvement loans. In addition, extending the term of conservation loans to the remaining useful life of a mortgage is likely to mean substantially increased interest payments over the life of the loan.

A mandate to open existing loans would create contingent liabilities for financing institutions because of the uncertainty of the timing of energy conservation investment demand. Accordingly, a bank's ability to control

its portfolio and its risk would be reduced. Finally, large numbers of mortgages have been sold on the secondary market and are no longer held by the original lenders. It may be difficult to locate these mortgages and to service the improvement loans.

The National Energy Act includes proposals to increase available financing for conservation, if it is needed. The Act proposes to remove the barriers to opening a secondary market for both Title I and conventional energy conservation home improvement loans. This has the potential for increasing the availability of loans by enabling lending institutions to sell off these loans. The Act also proposes that utilities be able to make Title I loans. Over a third of the owners of single family homes have no mortgages, but virtually all homeowners would be eligible for a Title I loan, either from an existing lender or through the utility.

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Q.11. What is the Administration's position on S. 701, which is also under consideration by this Committee? Please provide the Committee with a detailed comparison of S. 701 and Part C of S. 1469, the Administration bill.

A. The Administration favors the enactment of Part C of S. 1469, rather than S. 701. Both bills have the same basic objective; that is, to provide Federal financial assistance in the form of matching grants for the design and installation of energy conservation measures in existing school facilities.

Part C of S. 1469, as proposed by President Carter, would authorize a 3-year, $900 million program of matching grants to States to pay for up to 40 percent of the costs of making energy conserving modifications to both existing school and hospital facilities. We estimate that this program would enable such assistance to be provided to more than one-third of all school and hospital facilities--a majority of the facilities in need of such assistance and would save the equivalent of 125,000 barrels of oil per day. This program would represent a substantial and, we believe, sufficient contribution of Federal monies for these purposes.

S. 701 would authorize a 4-year, $2 billion program of matching grants to educational institutions and various State agencies for three distinct purposes: (1) Basic Grants for the costs of conservation measures; (2) Demonstration Projects for the development and use of promising conservation measures; and (3) Technical Assistance for the planning, development, implementation and evaluation of energy conservation and energy management projects.

In view of the numerous programs already underway within the Energy Research and Development Administration (ERDA) for the research, development and demonstration of innovative technologies that would conserve energy in school facilities, we believe the Demonstration Projects authorized by S. 701 are not necessary and could, in fact, be counterproductive.

The Technical Assistance programs authorized by S. 701 would provide assistance in the identification and design of appropriate conservation measures, as also provided for in Part C of S. 1469. But without a more precise definition of these activities than is contained in S. 701, we believe this aspect of the program could be open to abuse. Furthermore, the level of funding

for Technical Assistance authorized by S. 701 far exceeds the likely requirements of these institutions.

The Basic Grants, which are authorized by S. 701, are "to pay the Federal share of the costs related to energy conservation measures undertaken by any such institution, including the cost of insulation, remodeling, and renovation of school facilities." Section 6(a) of S. 701 further specifies that each applicant shall provide assurances that "energy will be conserved by such renovation and construction." Part C of S. 1469, on the other hand, contains a list of specific energy conservation measures eligible for such assistance. Such a list is considered to be important to the effective administration of the program. Because it is extremely difficult to isolate the benefits that will result from the adoption of a specific measure in a particular school building, a requirement that eligible measures must meet such a test could result in the performance of numerous detailed and largely unnecessary evaluations. A specific list of eligible measures would provide an immediate indication to all eligible institutions of the types of conservation measures they should begin to explore and would thus ensure the more rapid implementation of the program.

With respect to the roles the States would have in implementing the programs, the two bills differ considerably. Under Part C of S. 1469, the States would have the major role in administering the program. Schools and hospitals would apply for financial assistance only through State offices. In this manner, the existing administrative capabilities of the States would be fully utilized and there would be assurances that the program's implementation was consistent with other State and local programs for these institutions. S. 701, however, would involve the State educational and energy agencies only indirectly for the Basic Grants, and as additional applicants under the other sections of the bill. Giving the States a major role in reviewing and approving individual applications is, we believe vital to the effective implementation of the program.

Finally, under Part C of S. 1469 the Federal Energy Administration and, upon its establishment, the Department of Energy would be given the responsibility for implementing this program. On the other hand, S. 701 would give this responsibility to the Office of Education. Because the Administration's bill would cover both schools and hospitals and because it would be a temporary grant

program directed solely at conserving energy in existing school and hospital facilities, the soon to be created Department of Energy would be the most appropriate lead Federal agency. The important expertise of the Office of Education with respect to schools is recognized and would be regularly consulted during the development and implementation of the program.

COMPARISON
OF
Title I, Part C of S. 1469 to S. 701 (as reported, May 12)

Provision	Energy Conservation Program for Schools and Hospitals (Part C of S. 1469)	Emergency Educational Assistance Act (S. 701)
Objective	To provide Federal financial assistance to public and nonprofit schools and hospitals for the design and installation of energy conservation measures in existing facilities.	To provide Federal financial assistance to educational institutions for the demonstration, design and installation of energy conservation measures in facilities.
Funding Mechanism	Matching grants to States for payment of administrative and project costs incurred in the design, acquisition, construction and installation of energy conservation measures.	Three matching grant programs: o Basic Grants to educational institutions for payment of the costs of energy conservation measures. o Demonstration Project grants to State agencies and educational institutions involving the development and use of promising conservation measures. o Technical Assistance grants to State agencies, local educational agencies, and institutions of higher education for the planning, development, implementation and evaluation of energy conservation and management projects.
Energy Conservation Measures	Restricted to specified list of measures.	Not specified, but must conserve energy.

CONTINUED

COMPARISON
OF
Title I, Part C of S. 1469 to S. 701 (as reported, May 12)

Provision	Energy Conservation Program for Schools and Hospitals (Part C of S. 1469)	Emergency Educational Assistance Act (S. 701)
Eligible Institutions	Public and private, nonprofit elementary and secondary schools, colleges and universities, and hospitals (indirect grants to institutions thru States).	o Basic Grants - educational institutions, limited to local educational agencies, institutions of higher education and nonprofit elementary or secondary schools (direct grants to institutions). o Demonstration Projects - State educational agencies, State energy offices, other appropriate State agencies, and educational institutions. o Technical Assistance - State educational agencies, State energy offices, other appropriate State agencies, local educational agencies and institutions of higher education (excludes nonprofit elementary and secondary schools from direct assistance).
Federal Share	Up to 40% of project costs.	o Basic Grants: 50% o Demonstration Projects: 66 2/3% o Technical Assistance: 50%

CONTINUED

COMPARISON
OF
Title I, Part C of S. 1469 to S. 701 (as reported, May 12)

Provision	Energy Conservation Program for Schools and Hospitals (Part C of S. 1469)	Emergency Educational Assistance Act (S. 701)
Allocations Among States	o 90% among the States according to a formula based on population, climate and other appropriate factors. o 10% according to the availability and cost of fuel and other factors (according to special needs).	o Basic Grants - 80% according to population - not more than 1% to Guam, American Samoa, Virgin Islands and Trust Territories of the Pacific - the remainder discretionary o Demonstration Projects - in order to most nearly provide an equitable distribution among the States. o Technical Assistance - no provision.
Role of States	States would prepare and submit plans, and review, prioritize and approve individual applications.	State educational agencies would be consulted in preparation of applications and would be eligible to receive demonstration project and technical assistance grants.
Authorizations	$300 million for each of 3 years, beginning in Fiscal Year 1978. TOTAL: $900 million	o Basic Grants - $300 million for each of 4 years beginning in FY 78. o Demonstration Projects - $50 million for each of 4 years, beginning in FY 78. o Technical Assistance - $150 million for each of 4 years, beginning in FY 78. TOTAL: $2000 million
Administering Federal Agency	Federal Energy Administration (Department of Energy)	Office of Education (HEW).

Q.12. Could a utility participating in a conservation program under Subpart 1 of Part A of S. 1469 include an item not on the list of energy conservation measures in the bill among the measures they are encouraging homeowners to purchase? What is to prevent the utility from adding others and also adding the cost to the utility bill, as long of course as the customer agrees? Is there anything in the bill that would restrict this?

A. The measures included in Section 101(11) of S. 1469 are those which the FEA may require utilities to offer to their residential customers. Utilities will be required to show their customers clearly what the Federal standard is for their locality and type of building. Though nothing in S. 1469 would prevent utilities from offering additional measures, a consumer would have to be informed that such additional measures were optional.

Q.13. Section 103(a)(3) of S. 1469 would require the utility to furnish their customers a list of local suppliers and contractors that is designed to encourage participation by such contractors and suppliers in a nondiscriminatory manner. If the utility has had reports of shoddy workmanship by a particular contractor, could the utility screen such contractors from the list?

A. The plans submitted to the Federal Energy Administration (FEA) by State utility regulatory commissions must include "an adequate program for preventing unfair, deceptive, or anticompetitive acts or practices affecting commerce which relate to the implementation of utility programs within such State." (Section 102(d), S. 1469). The guidelines governing these programs will include standards for the installation of conservation measures. The utilities must also distribute lists of contractors able to offer the same installation services. Each of these requirements will help prevent consumer fraud and promote competition. Whether it would be the utility's role to remove inadequate contractors or that of some other body, such as a state commission, is not spelled out in the National Energy Act. This decision would be left to the discretion of the State, subject to FEA approval.

Q.14. Under S. 1469, would utilities be required to collect loan payments that customers owe to banks for loans made for energy conservation measures? What should be the sanctions for nonpayments? Termination of service?

A. The National Energy Act contains three requirements for utilities with respect to financing:

(1) Utilities must offer to finance or arrange to finance the installation of certain conservation measures;

(2) They must offer a repayment period of at least three years, though the customer may choose a shorter period; and

(3) They must allow the customer the opportunity to pay back the loan as part of monthly fuel bills.

The NEA has only one provision covering default on a loan carried by the utility: that the utility may require immediate repayment (i.e, less than three years) in the event of default. All other procedures covering default of a customer are left to the State

regulatory agency to determine. We have not proposed any particular sanction as a Federal requirement. Different States have handled similar loans in different ways, and we would expect procedures to vary State to State under the utility conservation program.

Q.15. I understand that the Administration has agreed with proposals advanced in the House of Representatives to add sectarian schools and hospitals and possibly nursing homes and orphanages to the list of eligible recipients under Part C of S. 1469. If this is done, is $300 million still an adequate authorization for appropriation?

A. The eligible recipients under Title I, Part C of H.R. 6831, as reported by the Subcommittee on Energy and Power of the House Committee on Interstate and Foreign Commerce, would include public and private, non-profit elementary and secondary schools, residential child care institutions (orphanages), colleges and universities, hospitals, nursing homes, and public and community health centers. This bill as originally proposed by the Administration would have restricted assistance to public and private, non-profit elementary and secondary schools, colleges and universities, and hospitals. The additions adopted by the Subcommittee increased the total gross square footage of institutional buildings eligible for assistance from about 7.1 billion to about 7.5 billion sq. ft. or by approximately 5 percent. We believe that these additions do not justify any expansion

in the authorized amounts recommended by the Administration. Under the bill reported by the Subcommittee on Energy and Power, it is estimated that up to 90 percent of the facilities eligible for assistance would receive funding for preliminary energy audits, approximately 30 percent would receive funding for detailed energy audits, and about 26 percent would receive funding for the installation of conservation measures. Given our limited understanding of the total need for such assistance and the many uncertainties concerning these estimates, we do not believe that expanded funding would be justified.

Q.16. Why is the list of energy conservation measures eligible for funding limited under S. 1469 to only the measures mentioned specifically in the bill? Can you anticipate other measures being more cost-effective in some schools and hospitals?

A. It was our intention in drafting this bill to provide financial assistance for the design, acquisition and installation of those measures which had been demonstrated to conserve energy and to be cost-effective in a wide range of existing school and hospital facilities. Funding was restricted to those energy conservation measures listed in the bill in order to provide an immediate indication to the participating institutions of which measures should be subjected to further examination and to enable FEA to accelerate the development and issuance of the regulations required for program implementation. Because individual school and hospital facilities differ considerably from one to the next, it is recognized that no single energy conservation measure would be applicable to all existing structures. Nevertheless, there are a range of specific measures, which are clearly intended to conserve energy, that would enable institutions to achieve the bulk of the potential for energy savings.

Since the submission of the bill to Congress, reasonable questions concerning some of the specific measures contained in, or excluded from, the list have arisen. Consequently, if additional measures can be identified, which are primarily intended to conserve energy and have been widely demonstrated to be cost-effective when applied to existing school and hospital facilities, we would welcome the opportunity to consider their inclusion in the list of approved measures.

93-653 O - 78 - 31

Q.17. What percentage of domestic energy consumption takes place in rented dwellings, apartments, etc.? What methods has the Administration had under consideration to improve energy efficiency in rental housing? What are the advantages and disadvantages of these methods?

A. We estimate that 31 percent of all residential energy is consumed in rented buildings. This estimate is based on estimates of consumption in single and multi-family buildings and mobile homes and on data on the fraction of each of these which is rented. Developing effective incentives for conservation in rented buildings is difficult because owners are often not responsible for all fuel bills and because many owners of multi-family rental buildings seek appreciation of the property rather than operating profits.

We considered a number of voluntary proposals in this area and have proposed three. First, owners of rented buildings are eligible for a tax credit of 10-20 percent for certain conservation investments, depending on the particular measure. This incentive will be attractive to those owners of rental buildings who do not intend to sell them in the near future and who at least pay for heating. This tax credit is easily administered

through the existing tax system. Owners who either pay no taxes, or who are unable to find adequate financing, or who intend to sell the building before the measures would pay for themselves will not be interested. We do not have a clear idea which group of owners is the larger for either single-family or multi-family buildings.

Our second proposal is to make the residential tax credit available to tenants. Many of the measures we propose will pay for themselves quickly enough to be attractive to some tenants, especially those in single-family buildings. However, many important conservation measures will not attract tenants.

Finally, low-income tenants in either single or multi-family buildings would be eligible for Weatherization Assistance under the Energy Conservation and Production Act. In order to insulate the home of a low-income tenant, States must obtain assurance from the landlord that the full benefit of the investment will go to the tenant, and many States may have difficulty developing enforceable agreements. However, funds will be available to States for these buildings, and we expect they will be used.

Certain mandatory measures were considered and rejected. In particular, we decided that a requirement that multi-family rental property be insulated at time of sale would create administrative costs for both Government and lenders which would outweigh the benefits of the additional assurance that the building would be insulated. That is, we expect that our proposals will result in the insulation of many buildings, and that it was worth waiting to measure their success before proposing mandatory action.

Page 42, line 9 Senator Domenici Communities where utilities are voluntarily in the retrofit business.

There is a wide range among utilities in their involvement in retrofit programs. Although many utilities currently have no interest in implementing retrofit programs, a substantial number have been involved for several years.

Approximately 40 electric utilities and 30 gas utilities across the country have ongoing insulation programs. In addition to this, there are a handful of rural electric cooperatives with similar programs. In most instances, the programs have been a successful consumer service. Homeowners view the utility as a responsible, knowledgeable member of the community with experience and expertise in winterizing homes.

Page 42, lines 15-18 Senator Domenici How does a utility bill its customers for insulation services?

There are three ways a utility can conduct a retrofit program:

a. The utility can use their own manpower to implement an entire program;

b. The utility can act as a liaison between the homeowner and the insulation installer;

c. The utility can turn the entire program over to a commercial organization and never have any direct contact with the homeowner.

In most instances, utilities involved in (a) or (b) above bill their customers directly. Depending upon their billing procedures, computer capability, etc., they may either include the cost of retrofit measures on the bill or bill the homeowner separately. In almost every instance, however, the homeowner has the option of paying cash (within 90 days) or financing it over a period of months (usually 36).

If the utility program is similar to (c) above, the customer is billed by the contractor who uses standard bank financing.

Page 42, line 20 Senator Domenici — Do you have any communities in which the private sector, aside from the utilities, is doing the same thing as the utilities. Do you have any comparisons of costs and the like?

We are not aware of any utilities or private businesses which offer the complete package of services which we propose to require utilities to offer. There are thousands of contractors which offer installation services similar to those now offered by some utilities, including at least 2000 insulation contractors and many others who offer storm windows and other services. No useful comparison has been performed of the prices which these private contractors charge and those charged by utility companies. The American Gas Association reports, however, that virtually all of its member gas companies who offer insulation to their customers use subcontractors to install the materials. Thus, it is the private contractors who benefit from the utility promotion programs. We are aware of at least two private firms which offer services which approach the National Energy Act proposals in scope. Energy Efficiency Systems of Baldwin, Wisconsin, contracts with utility companies to provide inspection, installation, and financing services to the utility customers. This firm then subcontracts with local installers. The Resource Conservation Engineers of Cambridge, Massachusetts, is marketing its own package of computerized home energy audits, installation and financing.

Page 43, line 7 Senator Domenici Do you have information comparing retail insulation prices now versus 6 months ago?

No Federal agency is now monitoring retail insulation prices, for either materials or installation. A wholesale price index for certain insulation materials used in new construction is maintained by the Department of Commerce, and the Council on Wage and Price Stability has agreed to monitor wholesale prices for those insulation materials most commonly used in retrofitting. We are discussing with the Bureau of Labor Statistics a system to monitor retail prices for various insulation materials in selected SMSAs.

FEDERAL ENERGY ADMINISTRATION
WASHINGTON, D.C. 20461

July 21, 1977

OFFICE OF THE ADMINISTRATOR

Honorable J. Bennett Johnston
Chairman, Subcommittee on Energy
Conservation and Regulation
Committee on Energy and Natural
Resources
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

Thank you for your letter of June 29, 1977, requesting the views of the Federal Energy Administration (FEA) on the points raised by the Federal Trade Commission (FTC) regarding Parts A, B, C, and G of S. 1469. Each major FTC problem and recommendation with respect to this legislation is addressed below.

Part A: Energy Conservation Programs for Existing Residential Buildings.

FTC Point I: Utility commissions must develop an adequate program to prevent "unfair, deceptive, or anti-competive acts or practices" in order to receive approval for their conservation plans. This authority may be construed to supercede similar existing authority in FTC statutes. The Commission proposes to add language to make it clear that FTC authority takes precedence.

FEA response: We support this amendment.

FTC Point II-A: Utilities may be able to dominate local retrofit markets if they are required to offer inspection, installation, and financing services. Their direct access to homeowners may make it easy for them to push other businesses out of the market. The Commission proposal would remove the mandatory requirement that utilities offer to install insulation in the homes of their customers, leaving to the discretion of the utility whether to install insulation. In addition, the FTC proposes to only allow utilities to enter this market as direct competitors, not through subcontractors. In addition, the Commission

proposes to require utilities to provide lists of alternative firms which could inspect homes for energy conservation.

FEA response: Adequate competition must be assured in local retrofit markets. However, the Commission's amendment to remove the requirement that utilities offer to install conservation measures would seriously weaken the effectiveness of this legislation in achieving President Carter's conservation goals, and we therefore strongly oppose it. The National Energy Act seeks to guarantee that virtually all homeowners will have access to a convenient and complete set of retrofit services, in the expectation that such access would greatly accelerate the installation of all the measures which we recommend. If there are predatory utilities that might attempt to monopolize the home retrofit business within their communities, as the FTC asserts, the proposed FTC amendment would not prevent their involvement in such activities. By requiring utilities to offer a complete package of services and to provide lists of their competitors, we expect that numerous private contractors will expand their services, thus encouraging competition. We support fully the FTC recommendation that utilities be required to offer their customers lists of alternative home conservation inspection services. We intend to work closely with the FTC and State regulatory commissions to develop guidelines and regulations to assure fully competitive local markets.

FTC Point II-B: Utility financing of home conservation measures may not be subject to the requirements of the Truth in Lending Act which apply to similar loans made by other lenders. These requirements encourage consumer shopping and credit price competition. The Commission proposes to include language requiring utility conservation financing activities to be covered by the Truth in Lending Act.

FEA response: We support this amendment.

FTC Point II-C: Though utility regulatory commissions must develop procedures for preventing unfair or deceptive acts or practices as part of their State plans, S. 1469 does not require the FEA to promulgate rules for this aspect of the program. The Commission proposes that the FEA promulgate such rules after consultation with the FTC.

FEA response: We agree with the FTC intent to provide consumer protection in each aspect of the program, and we

support this amendment. We will work with the FTC to address each of the subjects mentioned in Point II-C. In particular, the FTC has proposed a specific approach to assure that lists of alternative contractors and lenders are developed in a fair and open manner. We agree with the intent of the FTC suggestion and will work with them to promulgate an effective rule. It is our full intent to protect the consumer from illegitimate contractors. It is also our intent to guarantee that any qualified contractor has access to customers through the lists to be distributed by the utilities. S. 1469 provides the flexibility needed to balance these goals.

FTC Point III-A: Sales of conservation materials and solar energy devices will increase greatly if we are to achieve the President's energy conservation goals. Consumer fraud is likely to increase substantially in the absence of effective government regulation. The Commission proposes that they be granted specific legislative authority to address warranties and consumer remedies, product claims, and marketing and advertising claims for conservation and solar products.

FEA response: We share fully the FTC's concern for adequate consumer protection with respect to sales of conservation measures and solar devices. However, S. 1469 gives the FEA the authority to address these concerns when the bill is implemented which we fully intend to do. We therefore oppose this amendment. We will work closely with the FTC to develop regulations for State conservation plans, and we hope that the Commission will be prepared to devote appropriate resources to accommodate these concerns.

FTC Point III-B: The extremely tight time tables in S. 1469 for promulgation of standards and rules are likely to force the FEA to rely on privately developed standards for various products and materials. The Commission proposes that they be consulted in promulgating those standards to assure that their use will not decrease competition.

FEA response: We agree that the involvement of the FTC in the promulgation of product standards for the utility program will be invaluable. However, the FEA Authorization Act of 1977 requires consultation on exactly these subjects. This proposed amendment to S. 1469 is therefore unnecessary.

Part B: Energy Efficiency of Consumer Products

FTC Point IV-A: Additional information about the effects of specific actions on fuel economy would help consumers save energy and money. S. 1469 does not authorize the FTC to prescribe rules for the disclosure of rebates and taxes on cars in any media but television broadcasting and in print. The Commission proposes that they be authorized to prescribe rules for disclosure in all media, and for disclosure of information on octane ratings, car maintenance, and driving practices.

FEA response: We support the goal of the FTC recommendations to disseminate more automotive fuel economy information to the consumer. We agree with the broader disclosure of tax and rebate information. However, we have doubts that the particular FTC proposals for disclosure of other information will actually result in more information being used by consumers and that such use would reduce energy consumption. We assume that before using any broader powers which may be granted, the FTC would fully investigate the efficacy of such additional disclosure.

FTC Point IV-B: The standards required by this Part must be economically justified. This justification should include an assessment of the effects of the standard on competition. The Commission proposes that they be consulted in the development of these standards.

FEA response: We agree that the FTC must be consulted in the development of these standards. However, this amendment is unnecessary, since the recently enacted FEA Authorization Act already requires this consultation. We fully intend to consult with the FTC with respect to anti-competitive effects of the promulgated standards prior to their issuance.

Part C: Energy Conservation Program for Schools and Hospitals

FTC Point IV-D: Competition should be promoted in State and local purchases of conservation materials and products under this $900 million Federal matching grant program. The Commission proposes that FEA guidelines for the program contain rules designed to ensure that the States spend the grant monies in a manner likely to promote competitions, after consultation with the FTC.

FEA response: We agree with the action of the Subcommittee on Energy Conservation and Regulation in this regard. S. 701, reported by the Subcommittee on July 15 and passed by the Senate on July 20, does not include such a provision. It is our view that, if included, it would have required an unnecessary intrusion in the accepted procurement procedures of the public and non-profit schools and hospitals participating in the program. The provisions of S. 1469 do provide general authority to the Administrator to issue guidelines to ensure that Federal funds are used effectively, and it is our intent to monitor the expenditures of funds to achieve this end. Nevertheless, because the procurement of the necessary equipment and materials will be performed by the more than 20,000 participating institutions, rather than by the States or the Federal Government, there is no reason to believe the program would discourage competition. Futhermore, Federal Management Circular 74-7, Attachment O, specifically requires that grantees conduct procurement transactions in a manner so as to provide maximum, open, and free competition.

Part G: Federal Energy Initiatives

FTC Point IV-C: The Federal Government should take care that all available money authorized for Federal vanpooling, conservation retrofit of Federal buildings, and solar retrofit of Federal buildings does not go only to large, established firms or businesses. The Commission proposes that a provision be inserted in S. 1469 to ensure that small businesses receive a fair share of such money.

FEA response: We agree with the basic objective of the proposed amendments. However, it is our belief that this legislation is not the proper vehicle for instituting such a requirement. The basic statutes governing the procurement practices of many agencies already contain such provisions, and there are several other specific Acts which ensure that small businesses receive a fair share of Government contracts. Furthermore, it is our understanding that the Federal Acquisition Act of 1977 (S.1264), which is now under consideration by the Senate, would establish uniform procurement procedures for virtually all Executive Agencies. Consequently, although we recognize the concerns of the FTC with respect to the procurement of solar energy

systems, it is our recommendation that the proposed amendment be referred to the appropriate committee for its consideration in conjunction with S. 1264.

I appreciate the opportunity to comment on these provisions.

Sincerely,

John F. O'Leary
Administrator

FEDERAL ENERGY ADMINISTRATION
WASHINGTON, D.C. 20461

AUG 17 1977

OFFICE OF THE ASSISTANT ADMINISTRATOR

Honorable J. Bennett Johnston
Chairman, Subcommittee on Energy
Conservation and Regulation
Committee on Energy and Natural
Resources
United States Senate
Washington, D. C. 20510

Dear Mr. Chairman:

During a hearing before your subcommittee on June 21, 1977, at which representatives of the National Bureau of Standards (NBS) appeared, issues were raised that pertained to the testing by NBS of a device to improve the efficiency of electric motors invented by Cravens Wanless. In connection with that testimony, NBS submitted written responses to your letter of July 6, 1977, that included a proposed schedule for NBS's testing of the Wanless device.

There has been considerable interest in the device invented by Mr. Wanlass, which appears to have more promise and substantiation than most technological improvements that come to the public's attention. As of this time, there has been limited testing of the performance of electric motors retrofitted with the device by several private organizations, including a utility in Southern California, but there has been no extensive testing by the Federal Government. Because of the conclusion that any device that improved the efficiency of small electric motors would be applicable to the appliance efficiency targets program authorized by the Energy Policy and Conservation Act, the Federal Energy Administration (FEA) decided to investigate the possibility of laboratory and field testing of the Wanlass device.

As a result of several conversations, including discussions with NBS representatives, it became apparent that, if the energy efficiency improvements are verified, electric motors that include the Wanlass device could be included in appliances

manufactured in 1980. In considering the laboratory testing of the Wanlass device, we naturally first turned to NBS, which now is responsible for the technical analysis associated with appliance test procedures and energy efficiency targets; and at the time of the hearing and subsequent written responses by NBS, FEA and NBS anticipated a joint testing program. However, as our discussions and evaluation of the project continued, it became apparent that NBS would have to rely for a significant portion of its laboratory testing on the U.S. Army Electric Power Laboratory facilities at Fort Belvoir, Virginia, which has extensive experience in electric motor testing. In addition, it appeared that NBS personnel assigned to the Appliance Program had not routinely been involved in the testing and evaluation of electric motors. Therefore, after extensive discussions with personnel at Fort Belvoir, we determined that the most efficient and productive utilization of Government resources dictated that the evaluation of the Wanlass device be performed by the Electric Power Laboratory. In addition, the testing and evaluation proposal submitted by NBS indicated that there would have to be a reallocation of staff and funding away from the existing appliance program schedule, and given the tight deadlines under which we operate, this was an undesirable result.

If we can be of any further assistance, please let us know.

Sincerely,

Hazel Rollins
Assistant Administrator
Conservation

Answers Received From Department of Housing and Urban Development

HENRY M. JACKSON, WASH., CHAIRMAN
FRANK CHURCH, IDAHO
LEE METCALF, MONT.
J. BENNETT JOHNSTON, LA.
JAMES ABOUREZK, S. DAK.
FLOYD K. HASKELL, COLO.
DALE BUMPERS, ARK.
WENDELL H. FORD, KY.
JOHN A. DURKIN, N.H.
HOWARD M. METZENBAUM, OHIO
SPARK M. MATSUNAGA, HAWAII
CLIFFORD P. HANSEN, WYO.
MARK O. HATFIELD, OREG.
JAMES A. MC CLURE, IDAHO
DEWEY F. BARTLETT, OKLA.
LOWELL P. WEICKER, JR., CONN.
PETE V. DOMENICI, N. MEX.
PAUL LAXALT, NEV.

GRENVILLE GARSIDE, STAFF DIRECTOR AND COUNSEL
DANIEL A. DREYFUS, DEPUTY STAFF DIRECTOR FOR LEGISLATION
D. MICHAEL HARVEY, CHIEF COUNSEL
W. O. CRAFT, JR., MINORITY COUNSEL

United States Senate
COMMITTEE ON
ENERGY AND NATURAL RESOURCES
WASHINGTON, D.C. 20510

July 6, 1977

Dr. Donna E. Shalala
Assistant Secretary for Policy Development
and Research
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
451 Seventh Street, S.W.
Washington, D. C. 20410

Dear Dr. Shalala:

At the June 21 hearing before the Subcommittee on Energy Conservation and Regulation on Parts A, B, C and G of S. 1469, a number of issues were raised which could not be explored in detail because of time limitations. However, I believe several of these issues require full analysis and response prior to Committee markup of the legislation under consideration.

Accordingly, it is requested that you provide answers to the list of questions attached at the earliest possible date. As you know, we are hopeful that the Committee can report this legislation to the Senate in July. Your prompt response to this set of questions will greatly assist us in achieving this goal.

Any questions you may have about this request should be directed to James T. Bruce or Benjamin S. Cooper at 224-9894.

Sincerely,

J. Bennett Johnston
Chairman, Subcommittee on Energy
Conservation and Regulation

JBJ:bcg

93-653 O - 78 - 32

Questions for HUD

1. What certification is offered for work done under HUD home mortgage and improvement loans? Does HUD have the ability to provide for certification with respect to the insulation services contemplated in the President's plan? If not, what institutions should provide such certification?

2. What are the advantages and disadvantages of combining the FEA weatherization program and the programs operated by HUD for the general improvement of the dwellings owned or occupied by low income persons?

3. Provide the Committee with a copy of the HUD pamphlet "In the Bank or Up the Chimney".

4. List and describe briefly all HUD grant, loan and loan guarantee programs covering the purchase or improvement of residential and commercial buildings. Provide citations for the statutory authority and implementing regulations for each program. Indicate whether funds available under these programs can be used for energy efficiency improvements.

If such use is permitted, how often is the program used in this way?

If not, what are the advantages and disadvantages of opening up the program for such use? What new authority would be needed to accomplish this?

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, D.C. 20410

ASSISTANT SECRETARY FOR
POLICY DEVELOPMENT AND RESEARCH

AUG 3 1977

IN REPLY REFER TO:

Honorable J. Bennett Johnston
Chairman, Subcommittee on Energy
Conservation and Regulation
Committee on Energy and Natural
Resources
United States Senate
Washington, D.C. 20510

Dear Mr. Chairman:

This is in reply to your recent letter in which you posed several questions exploring issues raised at the June 21 hearing before the Subcommittee.

I have attached responses to the questions. If the Subcommittee believes that further examination of these issues would be helpful, please contact me or David Garrison, my Deputy for Policy Development and Program Evaluation, who can be reached at 755-5896.

Sincerely,

Donna E. Shalala

Attachments

1. What certification is offered for work done under HUD home mortgage and improvement loans? Does HUD have the ability to provide for certification with respect to the insulation services contemplated in the President's plan? If not, what institutions should provide such certification?

A: HUD carries out appraisals of properties in connection with the Department's mortgage insurance programs. Such an appraisal is intended to determine whether the property meets HUD Minimum Property Standards and other requirements. The appraisal is not intended to serve a consumer protection function, but to arrive at a determination of the value of the property and to assure that it has sufficient value to secure the loan insured by the Department. The appraisal evaluation is not a certification to the homebuyer or the lending institution that the property meets the relevant local building codes or Minimum Property Standards.

Certifications are not ordinarily performed under the Department's Title I property improvement loan insurance program, the HUD program most directly related to the energy conservation initiatives under consideration by the Committee. The Title I program operates through participating lenders, who may or may not make further requirements of the loan applicant or contractor.

In this respect, HUD does not "certify" work done under the program. HUD becomes involved with participating lenders chiefly when claims are made for insurance. At that point, the Department may examine the loan, to make certain that it was not made for an ineligible item, and may undertake to collect the unpaid balance. However, because most loans insured under Title I are repaid and relatively few claims are made, this effort does not involve major staff commitment, by comparison with mortgage insurance programs, for example.

As we have testified, it was contemplated in the President's program that utility companies would furnish an independent source of technical information about potential energy conservation opportunities in a given home. Residential energy conservation plans submitted by State regulatory authorities would contain an adequate program for preventing unfair, deceptive or anticompetitive acts or practices affecting commerce relating to implementation of the utility home energy conservation program in that State.

In our view, the term "certification" - as used in the question posed by the Committee - could apply to certification of the actual home improvement work itself, or to certification of the contractor or other firm performing work of this kind. Further, the term could cover a number of steps in the home improvement process: soliciting estimates for home repair and improvement, application for financing, completion of the work, and final payment.

With regard to certification of the work performed, we believe there are several difficulties inherent in setting up such a program. First, in order to effectively monitor performance of the work, the certifying authority may have to be present both before and after the work is accomplished. Second, there will be some difficulty in establishing the effectiveness of certain kinds of work, such as wall insulation, which is often not easily subject to inspection. Third, there is a problem in that homeowners might presume the existence of some degree of Federal liability for defects of materials and/or workmanship shown to have been a part of work certified to be acceptable by a Federal inspector.

HUD has had some related experience in a program authorized by Section 518(b) of the National Housing Act. In this program, the HUD Secretary is authorized to reimburse homeowners with certain FHA insured mortgages for critical defects that existed at the time the mortgage commitment was issued if a proper FHA inspection could have disclosed them. The defects must be serious, structural defects that threaten the life or safety of the residents. There has been a substantial lag between the submission of claims under the program and contracting for the performance of the repair work, due to staff limitations and the time required in the processing of individual requests.

Although there are a number of HUD programs intended to stimulate or insure financing for home improvements, including energy conservation improvements, we do not believe HUD would be an appropriate agency to conduct a certification program for actual work performed. The energy conservation programs proposed by the President are intended to stimulate homeowners to retrofit their dwellings, but would avoid the costs involved in the creation of large Federal organizations

to actually conduct or closely monitor the work performed.

Certification for the volume of work to be undertaken would require major increases in HUD field staff, together with training programs and development of regulations and guidelines for the new function. These steps would delay implementation of programs we think are long overdue and should be started immediately. Finally, HUD does not have the consumer protection experience that should be inherent in any effective certification program.

Certification of contractors may offer a more feasible method of providing for some degree of consumer protection. As noted above, there would be some delays involved in establishing the program, including delays for contractors seeking certification. Such a program would also have local market impacts. If Federal assistance were provided only for work performed by a certified contractor, those not certified would have considerably less opportunity to benefit from the Federal programs. Even without such a limitation on the provision of assistance, certification or listing of approved contractors would have an effect on homeowners' selection of firms to perform work in their homes.

In our view, any organization given the responsibility to certify contractors should have experience in programs established for protection of the consumer. At the Federal level, the agency with the most directly related experience is the Federal Trade Commission. In comments on Title I, Part A of the National Energy Act prepared by the FTC at the request of Chairman John Dingell of the House Subcommittee on Energy and Power, the following suggestion was presented:

> To avoid a complicated licensing process which could raise unnecessary barriers to entry into the conservation program, we would suggest that any contractor seeking to be listed by the utility must certify, under penalty of perjury, that it meets the standards (set by FEA for contractors). The utility would list any self-certified contractor requesting listing. Data to be included on the list should be determined by rule, with particular attention to the advisability of indicating which companies are bonded and which offer free inspections and estimates.

We would defer to the FEA on the question of whether such a provision should be included in the utilities program. However, we do believe such an approach would encourage contractors to provide a reasonable level of service.

Because the administration, enforcement and market impact of such a program would be local in nature, we believe the most appropriate vehicle would be an entity at the State or local level of government. We recognize that substantial differences exist between States in the statutory basis for consumer protection programs. Further, while some States have licensing and inspection programs that could provide a model for contractor certification, these State efforts are reported to vary considerably in effectiveness.

2. What are the advantages and disadvantages of combining the FEA weatherization program and the programs operated by HUD for the general improvement of the dwellings owned or occupied by low-income persons?

A: We believe acting to combine the FEA weatherization program with existing HUD programs to improve the dwellings of low-income persons would considerably delay delivery of weatherization assistance which is desperately needed by many low-income persons to reduce in some measure the impact of increased energy costs. We would therefore recommend that no such shift be considered at this time. As the Committee may be aware, Section 408 of HR 7893,

the "National Weatherization Act" reported June 20 by the House Committee on Banking, Finance and Urban Affairs, would require that a study of weatherization activities be conducted by the HUD Secretary, the FEA Administrator, the Secretary of Agriculture, and the Administrator of the Community Services Administration. The section calls for annual reports, to address, in part "the need for and desirability of modifying weatherization activities authorized by this Act, and amendments made thereby, and of extending such activities to a broader range of income groups than are being assisted under this Act and such amendments."

4. List and describe briefly all HUD grant, loan and loan guarantee programs covering the purchase or improvement of residential and commercial buildings. Provide citations for the statutory authority and implementing regulations for each program. Indicate whether funds available under these programs can be used for energy efficiency improvements.

If such use is permitted, how often is the program used in this way?

If not, what are the advantages and disadvantages of opening up the program for such use? What new authority would be needed to accomplish this?

A: Attached are several HUD publications which may be of assistance to the Committee. First, "HUD Programs" issued in March 1977 gives a listing of the Department's programs, together with references to the Public Laws creating them. Second, the "Digest of Insurable Loans," HUD Handbook 4000.1, issued September 1975 is a recent compilation of the most pertinent facts relating to the Department's mortgage and loan insurance programs authorized by the National Housing Act. Third, copies of PL 93-383, PL 94-375, and PL 95-24 are provided. These laws contain the basic authorities for the Community Development Block Grant Program. Fourth, a copy of HUD Issuance 6500, setting forth "Consolidated Community Development Block Grant Regulations" is also enclosed.

HUD grant, loan and mortgage insurance programs have financed rehabilitation of existing structures for many years. Insulation, the installation of storm windows and doors, caulking, weatherstripping and similar activities have been a normal part of these activities. However, energy-conserving rehabilitation or improvement activity is generally not reported as a separate element of activity. For this reason, we cannot fully respond to the Committee's questions in this area. There are some exceptions: figures on different kinds of loans made in the Title I Property Improvement Loan Program show a certain level of spending for insulation (see attached Table). However, these figures do not give a complete picture of "energy conservation" home improvements, since an undefined portion of expenditures for"heating and cooling," for example, or for "exterior improvements," could have been specifically intended to save energy.

We believe the measures proposed by the President would provide the best approach to increasing the level of energy-conserving improvement in residential and commercial buildings. Beyond those proposals, we would not recommend modifying the National Housing Act or the Housing and Community Development Act and related authorities.

Answers Received From National Bureau of Standards

Question 1: The Energy Conservation and Production Act assigned the National Bureau of Standards the role of developing the energy efficiency ~~standards~~ [targets] for appliances. How would the proposed Carter legislation alter your role?

Answer: Under P.L. 94-163 as amended by P.L. 94-385 the National Bureau of Standards (NBS) has the responsibility of developing:

(1) Test procedures for product types 1 through 14.

(2) Energy improvement efficiency targets for products 1 through 13.

The Administration's legislation (S. 1469) eliminates energy efficiency targets and substitutes energy efficiency standards, i.e., a minimum efficiency value for each product type. Therefore, the legislation necessarily eliminates the NBS role in the establishment of energy efficiency targets. While the proposed legislation does not statutorily provide NBS with a similar role in the setting of energy efficiency standards, nothing in S. 1469 would bar NBS from playing a similar role pursuant to appropriate administrative agreements. NBS's test procedure role would not change.

Question 1 (continued): Provide the Committee with a timetable for the development of test procedures for each of the thirteen appliance types identified in the Energy (Policy) and Conservation Act.

Answer: All test procedures have now been supplied to the Federal Energy Administration (FEA).

No test procedures have been developed for category 14 products since the FEA Administrator has not yet designated the products to be placed in this category.

At present FEA is holding hearings on the proposed test procedures which subsequently require an NBS analysis of comments and recommendations for finalization.

It is important to note that no test procedure can ever be considered as permanent. There are four situations, any of which may arise from time to time, which make surveillance, revision, and updating necessary. These are:

(1) New and largely unforeseen product improvements and developments which cannot be measured with the existing test procedures.

(2) Feedback from companies using the procedures or from the public using the results which may indicate a need for modification.

(3) Developments in the NBS laboratory which indicate a more effective or shortened procedure.

(4) Future changes in annual use cycles will occur that must be accounted for. The usage patterns of people change with modern family trends, changes in eating and other habits, and the introduction of new appliances. For example, the public eats in restaurants more than they did a few years back. The use of microwave ovens reduces the usage of conventional ranges and ovens. These factors, as well as smaller family size and more working wives, have appreciably reduced the usage of ranges and ovens. The law requires that test procedures reflect estimated average annual usage, and these changes must be tracked and the test procedures modified so that the annual average cost numbers on labels can be kept current.

There is no provision in S. 1469 to recognize and specifically require these subsequent revisions to the test procedures. On the other hand, H.R. 6831 (June 3, 1977, Committee Print) on page 3, lines 23-25 and on page 4, lines 1-9 [section 323(a)(7)], takes cognizance of this situation and provides suitable language for its execution. It states, briefly, that test procedures shall be evaluated from time to time "in order to determine whether such procedure should be amended . . . "

Question 2: Please find on Page 7.

Question 3: Has the National Bureau of Standards ever tested cellulosic insulation? If so, what did you find?

Answer: NBS has conducted three types of tests on the thermal properties of cellulosic insulations in the last three years (these are summarized in the attached paper entitled "Comparison of the Thermal Performance of Three Insulating Materials Commonly used to Retrofit Exterior Frame Walls in Existing Residences"):

1. Guarded hot-plate test using American Society of Testing and Materials (ASTM) Standard Method of Test C177-71. Test made for Federal Trade Commission in 1968.
2. Laboratory tests in 8 foot by 8 foot wall panels with 70°F temperature difference across panel for 60 days. 5°F on cold side, 95% R.H. 75°F on warm side, 45% R.H.
3. In wall sections of a test house on the NBS grounds. Heat transmission measured after 76 days, January - April 1975.

The general results of these tests were the following:

- The thermal conductance of cellulosic insulation in the laboratory tests of wall panels and in the test house were

within plus or minus 3% of that measured by the guarded hot plate (k=.26 - .27).

° The thermal conductivity of cellulose was about 8% higher than that for glass fiber in the guarded hot-plate tests, and about 7% lower than glass fiber in laboratory tests of wall panels and in the test house.

° No settling of the cellulose insulation in the walls of the test house was observed after 18 months had elapsed.

NBS has not yet conducted fire tests of cellulosic insulation. Early tests are planned on retention of fire retardant and effects of moisture; and full-scale and model fire tests of various insulation materials at NBS.

NBS is coordinating its activities in this area with FEA, the Energy Research and Development Administration, and the General Services Administration.

Question 4: Provide the Committee with your timetable for testing the principle exemplified by the "Wanlass engine."

Answer: The attached chart for the evaluation of High Efficiency Motors indicates our timetable for testing the principle exemplified by the "Wanlass engine." The phases agree with the plan outlined in our letter to Senator Metzenbaum of June 23, 1977, a copy of which is attached, regarding our plans for evaluation of the Wanlass motor for residential furnace applications. However, we have just learned that the motor identified for modification by Mr. Wanlass' engineer is not widely used in residential furnace applications. This may necessitate modification of our test plan or timetable.

The current work plan as outlined in our letter of June 23, 1977, tests the principle of the "Wanlass engine" for only one residential application and does not assess any impact on other residential motors.

Question 5: If Mr. Wanlass' electric motor meets all its expectations, do you feel this would justify even tougher energy efficency standards for appliances?

Answer: We do not know at this time if Mr. Wanlass' electric motor meets all its expectations. The appropriate effect of purportedly high efficiency motors such as Mr. Wanlass' on proposed energy efficiency standards would have to be evaluated based on an economic evaluation of any added cost vs. expected energy savings over the life of the appliance. For many appliances such as clothes dryers, clothes washers, dishwashers, and furnaces, the energy input to motors is a small fraction of the total energy input to the appliance. Thus, rather substantial efficiency improvements of motors would be required to justify "tougher" efficiency standards. For example, the motor we have chosen to evaluate, the furnace blower motor, is the largest energy consuming motor in the home other than those sealed in refrigeration compressors. The energy input to the motor, though not insignificant alone, is on the order of 1% to 1.5% of the total energy input to the furnace. Current motors are at least 50% efficient. Thus, an unlikely increast to 100% would increase the efficiency of the furnace by about 1/2% to 3/4%. It is worth noting that the energy "wasted" by the motor generates heat which heats the home in the winter but imposes an added load if the blower is used with a central air conditioner in summer.

Question 6: Is it possible to retrofit existing electric motors with Mr. Wanlass' invention? Do you think that Mr. Wanlass' invention should be a part of the proposed utility program for adding energy conservation measures to existing homes, assuming, of course, that his invention meets its expectations?

Answer: Our discussions with representatives of the Wanlass Corporation give some insight to the possibilities should his invention meet its expectations. Very large residential furnaces, as well as many older furnaces, may have a motor suitable for modification. A study of the economic feasibility of retrofitting 10-year-old motors would be required.

Our engineers were told by Mr. Wanlass that certain types of motors are not suitable for modification to his invention. For example, many current furnace motors are not suitable for modification. These are permanent split-capacitor motors used widely in furnaces with direct-drive blowers.

Compressor motors are generally sealed in the refrigeration system and are not readily acessable. The benefit of motor modification after breaking and recharging the sealed system is questionable.

Many appliance motors do not use large amounts of energy annually. The motors in clothes washers, clothes dryers, and dishwashers use less then 150 kilowatt-hours per year. We do not know if the split-phase motors used in these appliances are suitable for modification to Mr. Wanlass' invention.

It must be noted that there are serious questions of the impact of retrofit on product warrantees. An additional consideration is electrical safety unless the modified motor is tested by a recognized laboratory.

Therefore, there is no basis at present to recommend that the Wanlass invention be added to the energy conservation measures of the proposed utility program.

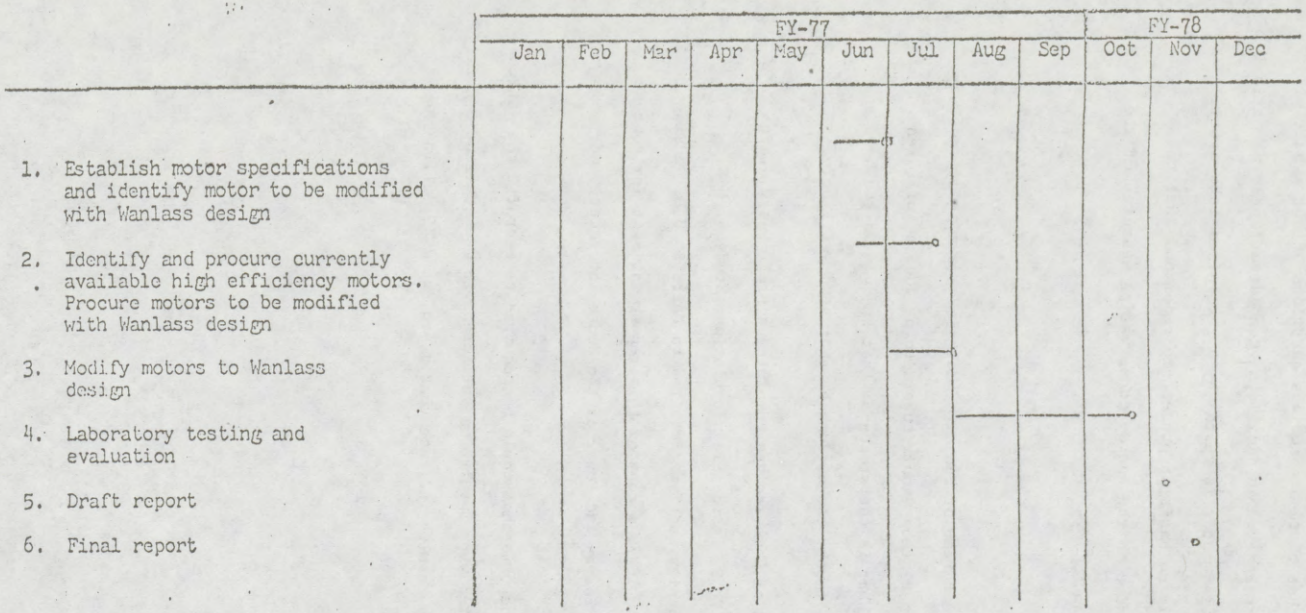
Question 2: Doesn't the Bureau of Economic Analysis have a study underway on the ability of the insulation manufacturers to produce a sufficient supply of insulation? What is the status of that study? Do you have any preliminary assessment of what the outcome of that study will be?

Answer: The Department of Commerce has completed a preliminary draft of its report entitled "U.S. Residential Insulation: Study of U.S. Insulation Industry Capacity and Time Required to Retrofit U.S. Housing Inventory." On July 14, 1977, a copy of this report was sent for comment to the Subcommittee on Energy and Power of the House Interstate and Foreign Commerce Committee.

The study focused on the time that would be required to retrofit the attics of residential structures with insulation sufficient to meet current Federal standards. Preliminary results indicate that a projected 25 million homes could be retrofitted by 1980.

QUESTION 4)

NBS PLAN FOR TEST OF HIGH EFFICIENCY MOTORS



o Milestone

6/27/77

Note: The initation of tasks 3 and 4 depends on identification and modification of a suitable motor by the Wanless Corporation.

Honorable Howard M. Metzenbaum
United States Senate
Washington, D.C. 20510

Dear Senator Metzenbaum:

This is in reply to your request of June 21, 1977, that I advise you of the actions being taken by the National Bureau of Standards (NBS) to examine and evaluate an induction motor embodying the energy saving design concept of the Cravens Wanlass Corporation. I believe, however, that a brief reference to the background of this matter will be helpful in describing our activities in this area.

Following news releases issued earlier this year by the Cravens Wanlass Corporation concerning an induction motor with high efficiency, the Federal Energy Administration (FEA) requested that NBS explore the possible application of the motor to appliances to improve their efficiency.

Subsequently, on May 25, 1977, a meeting was held at the Federal Energy Administration at which Mr. Cravens Wanlass, his engineers, and lawyers presented to NBS and FEA engineers some of the electric motor theory on which the Wanlass motor is based. Mr. Wanlass explained that certain types of electric motors currently available could be modified according to his specifications with a resulting improvement in efficiency, but that even greater efficiency improvements were possible if motors were designed from the start using his specifications. The NBS and FEA engineers expressed an interest in testing a Wanlass motor, and asked how they might obtain some motors. It was agreed that the motor performance requirements of each specific application dictate the type of motor used. A residential furnace blower motor which is usually between 1/6 and 3/4 H.P. was suggested as an appropriate initial application to examine.

Our plans for the technical evaluation of the Wanlass motor for residential application include a laboratory testing program and a performance analysis. The Cravens Wanlass Corporation does not currently have a supply of electric motors available for sale and so before testing can be started we must:

1. Select typical motor specifications (power output, speed, torque requirements, etc.) for current furnace blower applications.

2. Obtain a recommendation from the Wanlass Corporation for the type of motor which when modified will result in the best efficiency while meeting the performance specifications of 1.

3. Have at least two motors modified to the Wanlass specifications by the Cravens Wanlass Corporation or, at their option, obtain instructions on how to make the modification.

The test program will incorporate both dynamometer tests and other performance and safety measurements. Tests on the dynamometer will include:

a. Torque versus speed
b. Torque versus current
c. Acceleration from start
d. High and low voltage

The additional performance measurements will include:

a. Capacitor voltage
b. Winding temperature
c. Thermal protection
d. Winding current

In a parallel effort we plan to run similar tests on currently available high efficiency motors from other sources to compare the performance trade-offs which could effect use as a furnace blower motor such as starting torque, multi-speed requirements, ventilation requirements, low voltage protection, and size limitations. Our analysis will include calculations of any efficiency improvement and estimated annual savings from the use of the Wanlass motor in a typical home furnace.

The present status of our work is that Donald Asp and Douglas Sallen, engineers with Cravens Wanlass Corporation, are attempting to identify a motor which will be suitable for modification and which will be compatible with current residential furnace design. They have estimated that they will be in a position to specify a suitable motor by June 29, 1977. When this information is available, we expect that FEA will provide the necessary funding to proceed with this project. On completion of the modification of the motor by the Cravens Wanlass Corporation, NBS can then proceed with the laboratory testing program.

It is estimated that the laboratory evaluation and the performance analysis for this furnace blower application will be completed approximately four months after receipt of the modified motors and the other high efficiency motors.

I believe this program will provide sufficient information on which to judge the potential energy savings of the Wanlass motor for residential furnace applications. In the event you have any further questions regarding our activities in this area, please feel free to contact me.

Sincerely,

Original Signed By
Ernest Ambler

Ernest Ambler
Acting Director

Appendix II

Material Submitted by the Department of Commerce

UNITED STATES DEPARTMENT OF COMMERCE
Office of the Secretary
Washington, D.C. 20230

July 14, 1977

Honorable Henry M. Jackson
Chairman
Energy and Natural Resources Committee
United States Senate
Washington, D. C. 20510

Dear Senator Jackson:

We recently furnished the enclosed report, "U.S. Residential Insulation: Study of U.S. Insulation Industry Capacity and Time Required to Retrofit U.S. Housing Inventory," to Mr. Dingell. We are of the opinion it will also be of interest to you.

Should you have any questions about it, please let me know.

Sincerely,

Anne Wexler
Deputy Under Secretary for
Regional Affairs

Enclosure

cc: Honorable Thomas L. Ashley
Honorable Al Ullman

ERGY AND NATURAL RESO
JUL 15 1977
WASHINGTON, D.C.

U.S. RESIDENTIAL INSULATION:
STUDY OF U.S. INSULATION INDUSTRY CAPACITY AND TIME REQUIRED TO RETROFIT U.S. HOUSING INVENTORY

PRELIMINARY REPORT

Prepared by Construction and Forest Products Division
Office of Business Research and Analysis
U.S. Department of Commerce

July 8, 1977

EXECUTIVE SUMMARY

President Carter's energy proposals, sent to the Congress on April 22, 1977, included a plan to increase the pace of insulation retrofitting of existing housing structures. Among the questions posed by that plan was the question of whether or not the insulation industry would have production capacity sufficient to meet the increase in demand created by a stepped-up retrofitting program.

An in-depth study of the insulation industry to probe the capacity question was initiated about two months ago by the Bureau of Domestic Commerce, and this report summarizes the preliminary results of that survey. A final report of the study will be released when the survey questionnaires from non respondents as of June 30, 1977, representing 5 to 10 percent of the total estimated capacity, are received and analyzed.

Since the data already received covers 90 to 95 percent of the insulation industry's capacity, the preliminary results of the study can be viewed as reasonably conclusive. An analysis of the existing U.S. housing inventory revealed that approximately 25.5 million housing units could be realistically retrofitted with enough insulation to meet current federal standards. The estimate of the amount of insulating materials needed each year to satisfy demand from both new and existing housing was based on this figure plus current year and projected housing starts.

The questionnaires returned by insulation manufacturers provided data on both existing capacity and capacity expansion plans through 1979. These data indicate that the industry is capable of producing enough insulation to complete, by 1981, the retrofitting of all residential units that are now inadequately insulated if attics only are retrofitted. If walls are also retrofitted, the completion date is estimated at 1983.

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I. INTRODUCTION

This study was undertaken by the Bureau of Domestic Commerce (BDC) to assess the capacity -- both present and anticipated by 1980--of the manufacturers of thermal insulation and thereby determine their ability to supply the material required to retrofit the nation's existing housing inventory with sufficient insulation to meet current thermal efficiency standards. The data released in this report were collected to assist the Executive Branch and Congress in dealing with energy-related matters.

A. Background

President Carter's energy proposals were sent to the Congress April 22, 1977, and the Congress has been examining different parts of the proposals in various appropriate committees and subcommittees. Among the President's proposals was a plan to expand the pace of insulation retrofitting of existing housing structures. One of the questions posed by that proposal, and recognized by the Executive Branch, pertained to the capability of industry to meet anticipated demands for energy-related building materials such as thermal insulation and storm doors and windows.

Although existing statistical data indicated there would be no problem in supplying a sufficient number of storm doors and windows to meet anticipated demand, there was a paucity of information available on the present or future production capability of thermal insulation producers. This aspect was specifically mentioned by BDC's Director of the Construction and Forest Products Division in his testimony on May 9 before the House Commerce Committee's Energy and Power Subcommittee. The Subcommittee also expressed concern that its legislative efforts would be hampered by a lack of precise and related information.

An in-depth study of the insulation industry was undertaken about two months ago by the Bureau of Domestic Commerce, and this report summarizes the preliminary statistical results of that survey. It presents some conclusions about the ability of the industry to meet the demand for its products which could develop with enactment of legislation to spur insulation retrofitting of existing homes.

B. Scope

This study includes an assessment of all materials now used for thermal insulation in buildings, but its conclusions

relate only to the availability of and demand for products used in residential structures. The assessment of requirements for retrofitting non-residential buildings is not part of this study.

C. Survey Procedures

The primary data on industry capacity to produce thermal insulation was obtained through a mail questionnaire to producers of insulation materials (see attachment A in Appendix). The mailing list was developed especially for this survey by BDC analysts from previous knowledge of the industry, industry association membership lists, machinery manufacturers, Dun and Bradstreet directories, and other, similar listings. A total of 388 questionnaires were mailed to companies known or thought to produce some kind of thermal insulation. Of these, 21 questionnaires were returned by the Postal Service as undeliverable, 76 questionnaires were returned by companies which reported that they did not manufacture building insulation materials, and 142 questionnaires were returned with usable data by June 30, 1977. When this preliminary report was prepared, 149 firms had not yet responded. A final report incorporating the returns received since July 1, 1977 from non-respondents will be prepared after all questionnaires have been accounted for. We believe that the questionnaire responses on hand at the present time represent between 90 and 95 percent of total industry capacity.

Other data used in this study were obtained from the Bureau of the Census, Federal Energy Administration, Council on Wage and Price Stability and HUD.

Although the current and projected supplies of insulation materials was related to retrofitting of both attics and sidewalls of housing units, we do not expect to see any sizable volumes of these products used in sidewall reinsulation, given the relatively high cost of the procedure and its long pay-back period. It is also recognized that new construction will require a larger use of insulation materials than in past years as new standards for energy conservation are enforced with the building community.

D. Assumptions/Definitions

This study has been predicated on a number of assumptions.

One assumption critical to the conclusions of the study is that current thermal requirements of HUD's Minimum Property Standards are considered adequate. If new, unpublished standards are to be used as the eventual criteria for determining thermal adequacy, the industry's ability to meet anticipated demand should be modified accordingly.

Another assumption is that all new housing will be built to meet or exceed HUD's current Minimum Property Standards, and that housing starts will average 2 million units annually for the next ten years. We expect moderate annual fluctuations around that average, but not as drastic as those we have experienced during the past five years.

We assume that it is neither economically feasible to retrofit existing mobile homes with added insulation, nor realistic to expect owners of apartments and condominiums with five or more units per building to install much additional insulation unless required by law. Most of these multifamily units are of masonry construction which is extremely difficult and expensive to retrofit with wall insulation; adding insulation to the roof of a multi-story apartment or condominium has minimial effect on the overall thermal efficiency of the building. Several steps can be taken to economically improve the thermal performance of multifamily units, but added insulation is not considered to be one of them.

It is estimated on the basis of various industry statements that 8 to 9 million houses have been voluntarily retrofitted with insulation since the 1973-74 oil embargo and ensuing energy crisis. We have assumed that these houses are now adequately insulated to meet current thermal efficiency standards.

It is further assumed that the average roof/ceiling area for existing residences with less than 5 living units is 1,000 square feet and the average exterior wall area (less doors and windows) is 1,200 square feet. Retrofitting this average house with R-11 insulation in walls would require 200 lbs. of fiberglass of 700 lbs of cellulose. Retrofitting this house with R-19 ceiling insulation would require 300 lbs. of fiberglass or 800 lbs. of cellulose.

II. HOUSING PROFILE

Part A of the 1975 Annual Housing Survey published by the Departments of Commerce and HUD contains several statistics that contribute to an overall evaluation of the residential thermal efficiency problems we are facing, as well as some proposed solutions. Table I summarizes the pertinent data from the survey, both nationally and by four geographic regions.

In colder climates of the Northeast and North Central States, we find that 79 and 84 percent (7.6 and 12.4 million), respectively, of all one family residences have some roof insulation and 67 percent (12.7 and 6.7 million) of one family homes in the South and West have some roof insulation. Anywhere from 5 to 12 percent of the home owners don't know whether or not their roof is insulated. Although many of these homes require more insulation to bring them up to current standards, the situation is not as bad as was thought at first[1/].

It is estimated that 8 to 9 million houses have been voluntarily retrofitted with insulation since the 1973-74 energy shortage. Probably half of these units are included in the 1975 Census data and the other 4 million should be added to the Census figures. Most of this retrofitting involved ceilings, but not walls. This is because of the relative ease and low cost of insulating ceilings compared with walls. In addition, retrofitting existing walls with added insulation produces benefits that may not justify the costs, and there are also concerns about creating possible decay and paint peeling problems due to condensation in wall cavities that do not have proper vapor barriers.

In the Northeast, 61 percent (6.8 million) of existing homes were built prior to 1950, when use of thermal insulation for walls and ceilings in residential construction became fairly common, but 42 percent (7.4 million) of the residences in the Northeast are multifamily units, such as the brick or brownstone buildings and high-rise apartments in older sections of New York, Philadelphia, Newark, and Boston. These would be difficult and expensive to retrofit to meet current insulation standards. In the North Central Region, the figures are 52 percent (10.0 million) built prior to 1950, and 25 percent (5.2 million) multi-family units, most of which are in the larger cities. In the South and West, the overall

1/ This assumes current thermal requirements in FHA Minimum Property Standards for new housing are adequate.

housing inventory is much newer, with only 35 and 33 percent (8.7 and 4.9 million) built prior to 1950. Multi-family units represent 20 and 27 percent, respectively, (5.0 and 4.0 million), of the total in these regions. Nationally, over 21.5 million homes out of the total 77.5 million inventory are multifamily in which some steps can be taken to improve thermal efficiency, but where installation of additional insulation may not be the most cost-effective approach to solving the problem.

The electric utilities started promoting "Total Electric" housing in the late 1950's and early 1960's. At that time, Edison Electric Institute had strict thermal efficiency requirements for buildings in which electric heating units could be installed. This amount of insulation is equivalent to current Federal Housing Administration (FHA) Minimum Property Standards for new housing, and can be considered adequate. According to the Bureau of the Census report, over 9 million homes are heated electrically, an estimated 90 percent of which are single-family dwellings.

Over 3 million families currently live in mobile homes in the United States. Although the amount of insulation used in older models in less than half the amount used today, it is not economically feasible to add insulation to these housing units. We assume that:

1. all 3.3 million mobile homes are either adequately insulated or cannot be retrofitted with insulation;

2. all of the multifamily buildings with five or more units (11.8 million) are either adequately insulated or cannot be economically retrofitted with insulation;

3. 90 percent (8.3 million) of the electrically heated homes are single-family units requiring no additional insulation; and

4. 4 million single-family units have been retrofitted with roof insulation since the Census figures were obtained.

Based on these assumptions and the data available for this study, it may be concluded that 50 percent of the single family homes identified as having roof insulation (19.6 million) were built with adequate insulation to meet current standards

and 50 percent of the multifamily buildings with 2-4 units (4.9 million) are either relatively new buildings, built with enough insulation to meet current thermal standards, or cannot be economically retrofitted with insulation. Thus, only 25.5 million units appear to be candidates for additional insulation. However, over 50 percent of these homes are in the South or West, where climatic conditions make added insulation a questionable economic investment for the heating season. In addition, nearly 50 percent of these southern and western homes rely on natural ventilation rather than air conditioning for summer cooling, making added insulation an unneeded energy conservation measure during the summer. Unless the law required mandatory installation of insulation in these homes, or the installation were completely subsidized by the government, it is questionable whether many of these southern and western homeowners would invest in added insulation for their homes.

TABLE I 1975 Housing Inventory (000)
Occupied Year-Round

		Northeast		No. Central		South		West		National	
		Total	%	Total	%	Total	%	Total	%	Total	%
Type	1 family detached	8,246	48	14,203	69	17,750	71	9,109	63	49,489	64
	1 family attached	1,270	7	499	2	820	3	541	12	3,129	4
	2-4 family	3,690	21	2,691	13	1,935	8	1,487	10	9,802	13
	5 or more	3,750	21	2,497	12	3,036	12	2,509	17	11,792	15
	Mobile	326	2	721	3	1,483	6	812	6	3,342	4
Age	April 1970-75	1,420	8	2,414	12	4,747	19	2,631	18	11,212	14
	1965 - March 1970	1,566	9	2,368	11	3,888	16	2,009	14	9,831	13
	1960-65	1,403	8	1,895	9	2,896	12	1,866	13	8,060	10
	1950-59	2,458	14	3,296	16	4,752	19	3,094	21	13,600	18
	1940-49	1,514	9	1,761	9	3,052	12	1,648	11	7,974	10
	1939 or earlier	9,100	52	8,877	43	5,689	23	3,210	22	26,877	35
Heating Fuel	Utility Gas	6,446	37	13,666	66	11,352	45	9,469	65	40,933	53
	Bottled Gas	133	1	1,317	6	2,308	9	389	3	4,146	5
	Oil, Kerosene, etc.	8,875	51	3,027	15	3,508	14	889	6	16,299	21
	Electricity	802	5	1,154	6	4,965	20	2,253	16	9,173	12
	Coal or Coke	178	1	128	1	228	1	39	-	573	1
	Wood	55	-	82	-	565	2	151	1	852	1
	Other	20	-	18	-	10	-	31	-	78	-
	None	-	-	1	-	169	1	297	2	468	1
Air Conditioning	Room Units	5,886	34	6,338	31	8,451	34	2,107	15	22,781	29
	Central	1,145	7	4,083	20	8,115	32	2,193	15	15,536	20
	None	10,431	60	10,190	49	8,458	34	10,157	70	39,236	51
Roof Insulation 1-family	Yes	7,550	79	12,361	84	12,670	67	6,709	67	39,290	74
	No	1,326	14	1,327	9	4,240	23	1,868	19	8,762	17
	Don't Know	551	6	795	5	1,599	8	1,192	12	4,137	8
Total		17,462	22	20,611	27	25,023	32	14,457	19	77,553	

III. PROFILES OF PRODUCT SECTORS

This section of the report provides a brief description of each insulation material considered in the study and summarizes information obtained from the completed survey questionnaires. The tabulated capacity figures include current production capacity for January 1, 1977, plus financially approved expansion plans as well as proposed expansion plans with no firm financial commitment for January 1, 1980. All questionnaire respondents were asked to delete insulation used for industrial purposes from their reported production levels. No attempt was made to determine the number of new entries into the insulation business by 1980, but discussions with equipment manufacturers indicate the cellulose sector is currently increasing by 10 to 12 new facilities per month. If this is true, our survey results project a conservative capacity estimate for 1980.

Although prices of insulation materials are a major concern of policy makers, and historical wholesale price index figures for fiberglass insulation and all construction materials are provided in appendix B, no attempt has been made to predict future prices for any insulation materials. Too many variables exist to make such predictions viable.

A. Fiberglass

Fiberglass insulation is made by subjecting molten glass to a strong blast of air, which blows the material into long, thin threads. These threads then solidify into a wool-like mass that traps many small pockets of air, thus providing its thermal resistance value of approximately R.4.0 per inch of thickness.

Fiberglass building insulation comes in the form of either blowing (loose fiber) wool or batts and blankets. Thickness of batts and blankets normally ranges from two to six inches. They are available with or without a vapor barrier of aluminum foil or kraft paper.

The fiberglass manufacturing industry currently consists of three firms: Owens-Corning Fiberglas Corporation, Certain-teed Corporation, and Johns-Manville Corporation.

The production capabilities of the industry are as follows:

Loose Fiber

January 1, 1977	January 1, 1980
Million Square Feet of R-19 Equivalent	Million Square Feet of R-19 Equivalent
535	763

Batts and Blankets

January 1, 1977	January 1, 1980
Million Square Feet of R-11 Equivalent	Million Square Feet of R-11 Equivalent
8,314	11,288

B. Rock Wool

Rock wool -- sometimes referred to as slag wool -- is made by melting steel, copper, or lead slag, pouring the molten product into a jet of steam, and spinning it. A binding agent is applied and the wool is allowed to dry. Upon completion of this process, rock wool is treated the same as fiberglass; it is made into blowing wool and formed into batts and blankets. Insulating efficiency is about R.3.4 per inch of thickness.

There are ten producers of rock wool insulation with eight of the companies reporting by June 30, 1977. The estimated production capacities of the rock wool insulation industry as of January 1, 1977 and January 1, 1980 are:

Loose Fiber

January 1, 1977	January 1, 1980
Million Square Feet of R-19 Equivalent	Million Square Feet of R-19 Equivalent
486	893

Batts and Blankets

January 1, 1977	January 1, 1980
Million Square Feet of R-11 Equivalent	Million Square Feet of R-11 Equivalent
907	1,178

C. Cellulosic Insulation

Cellulosic insulation is available in two forms: loose fill and spray. The loose fill form, whose main market is residential structures, is made by reducing used newsprint, paperboard stock, or virgin wood fiber, to their original fiber form, and impregnating the fibers with fire-retardant chemicals, such as borax, boric acid, or ammonium sulphate. The resulting product is a fluffy and light material that can be either poured or blown into place. Sprayed-on cellulosic insulation is made in a similar fashion, except for adding an adhesive so the product will stick to structural surfaces. This product is sprayed onto various parts of commercial and industrial buildings, such as roof decks and sidewalls.

Thermal efficiency rating for cellulose installation is R.3.7 per inch of thickness. The insulative quality of cellulosic insulation is provided by air spaces between the fibers, air cells within the fibers, and the fiber wall itself, all of which resist the flow of heat.

Cellulosic insulation is not a new product. It has been used as an insulating material in the United States for about 50 years.

The current number of manufacturers is unknown, but knowledgeable estimates range from 250 to 350. The number of manufacturers is certainly increasing. One observer has stated that currently between 10 and 12 manufacturers enter the business every month. The industry is subject to easy entry since the technology is rather simple and well-known, and the capital requirements are not high (some machinery manufacturers offer packages that start as low as $65,000; however, industry spokesmen believe that to produce a high quality product, an investment of the magnitude of $500,000 to $1,000,000 is required).

The data provided by 74 companies add up to an annual production capacity for loose fiber cellulosic insulation manufacture as follows:

January 1, 1977	January 1, 1980
(lbs.)	(lbs.)
1,507,346,000	3,636,518,000

D. Expanded Minerals

1. Perlite

Perlite is a glassy volcanic rock mined in the western United States. It is distinguished from other volcanic rocks by the fact that when heated to a suitable point in its softening range, the crude rock pops like popcorn. It expands four to twenty times its original volume as the water content vaporizes and creates countless bubbles in the heat-softened glassy particles. These bubbles partially account for the thermal insulation qualities of expanded perlite. Its R rating is 2.7 per inch of thickness.

Although there are other, more important uses for expanded perlite, it can be treated with silicone for water repellency and used as a loose fill insulation material for concrete block walls and cavity-type masonry walls. In addition, loose fill perlite can be used for attic insulation. Perlite granules can also be impregnated with a binder and made into slabs for roof insulation. There are about 20 manufacturers of this product.

According to survey data, from 18 responding companies that manufacture expanded perlite loose fill insulation, the production output is as follows:

January 1, 1977	January 1, 1980
71 million cubic feet	73 million cubic feet

2. Vermiculite

Vermiculite is the geological name given to a group of mica-like minerals. When subjected to heat, vermiculite has the unusual property of exfoliating, causing

its flakes to expand to a cork-like consistency by the sudden expulsion of chemically combined water.

Thermal insulation is a major use of vermiculite. Its major building insulation application is loose fill, which can be used to insulate attics and wall cavities. The free-flowing vermiculite granules can be either poured or blown into place. Its thermal resistance rating is about 2.2 per inch of thickness. The product is made by 13 companies.

The production capacity of the industry at the beginning of 1977, according to the 13 reports received, was 116 million cubic feet. There are no significant expansion plans according to the surveyed companies.

E. Plastic Foams

Plastics constitute a major material for thermal insulation, since many polymer products can be expanded into low-density foams with low coefficients of heat transmission. The thermal ratings for these products range from 3.5 to 6.3 per inch of thickness. A table of thermal resistance ratings for most insulation materials is provided as appendix E. This expansion in volume of most thermoplastic and thermoset resins is accomplished by use of a blowing agent (such as a gas), that transforms the resin into a cellular structure resembling a mass of tiny hollow spheres fused together. Most of these plastic foams can be applied by one or more of these techniques: (1) pour-in-place, in which the foam system components are dispens dispensed from a hose as a liquid stream into a cavity where they react and expand to fill the void; (2) frothing, a variation of the pour-in-place process in which the foam is dispensed in a partially expanded state; and (3) spraying, which employs special spray guns that perform the dual function of mixing and atomization. In addition to on-site foaming, cellular plastics are factory-prefoamed into boards and planks for insulating roofs and foundations of houses (particularly those without basements). All polystyrene foam is used in this form.

The most important cellular plastics used for building insulation are polystyrene, polyurethane, polyisocyanurate, and urea formaldehyde foam. The last is becoming important in the retrofit market for home sidewall insulation.

There are about 24 suppliers of the foam ingredients for plastic insulation. Currently, plastic foam is not being used in any large volume for residential insulation. This is partly a function of technology.

For example, polyurethane foam has variable expansion characteristics and requires the services of a highly skilled installer. At present, it is limited to foaming between house studding -- before the wall is closed -- during the construction process. It is also partly due to the fact that most suppliers and their applicator-distributor network have concentrated on the commercial and industrial building market.

On the basis of 21 reports available as of June 30, 1977 the estimated production capabilities of the various plastic foam suppliers are:

Polyurethane and Polyisocyanurate Foam Board

January 1, 1977	January 1, 1980
447 million board feet	1,254 million board feet

Polyurethane Foam
(two-liquid components for on-site application)

January 1, 1977	January 1, 1980
392 million cubic feet in place	405 million cubic feet in place

Polyisocyanurate Foam
(two-liquid components for on-site application)

January 1, 1977	January 1, 1980
19 million cubic feet in place	22 million cubic feet in place

Polystyrene Foam Board

January 1, 1977	January 1, 1980
937 million board feet	1,264 million board feet

F. Aluminum Reflective Foil

Reflective insulation is accomplished by the use of bright surfaces that reflect heat in open spaces rather than absorb it. This type of insulation can be used in stud, rafter and joist spaces to insulate walls, roofs, ceilings, and floors from loss of heat. The most important reflective insulation material is aluminum foil, which is most commonly used to surface fibrous glass and other mineral wool batts and blankets. It is also fabricated into products for use in multi-layer reflective insulation. It is this type of product on which we obtained the following data.

Only a few companies (probably less than six) manufacture this product. In order to avoid breaching the confidentiality aspects of this survey, we cannot disclose the annual production capacity of this industry until additional reports are received.

IV. CONSTRAINTS ON PRODUCTION EXPANSION

Although some questionnaire respondents identified "reliable supply of energy" and "availability of capital" as possible constraints on production expansion, the only technical constraints reported were availability of boric acid and wastepaper by producers of cellulose insulation. A separate report on the boric acid and sodium borate (borax) situation is now in preparation in the Office of Business Research and Analysis. Preliminary conclusions of the boric acid study indicate that for 1976 production of cellulosic insulation estimated at 350,000 tons, some 70,000 tons of flameproofing chemicals were required. It is further estimated that about 25 percent of this chemical usage was represented by boric acid, equivalent to 17,500 tons as boric acid. The remaining 75 percent of chemical usage comprised sodium borate and/or a variety of other inorganic chemicals.

Based on probable 1976 production of 140,000 tons of boric acid, cellulosic insulation required 12 percent to 13 percent of total U.S. boric acid production. At the present time, all three U.S. producers have their U.S. facilities for boric acid in operation and only nominal plant capacity expansions are projected for the near future.

There is now a very real shortage of boric acid in the U.S. Both primary producers, and major distributors or resellers have regular established customers on allocation. Marketers are unable to provide assurance of supply to new customers who are entering this business. With the expected increasing production of cellulosic insulation the shortage of boric acid may not be relieved until late 1978.

Various alternate flameproofing compounds are being examined in hope of alleviating the boric acid shortage. There is not yet any clear indication as to the technical performance or commercial acceptance of such substitute products.

The respondents indicating a potential problem obtaining sufficient quantities of wastepaper were all located in small isolated communities or sparsely populated states where newspaper collections may not be as well organized as it is in densely populated urban centers. However, it is believed that local shortages can be overcome as wastepaper demand strengthens and stabilizes prices at a level high enough to make wastepaper collection attractive.

V. REQUIREMENT OPTIONS

The data provided in this report can be used to develop a multiple of scenarios based on many assumptions. Four examples are presented here, based on current production capacity and capacity expansion that is under construction or has been financially approved for start up during the next 3 years, but excluding proposed expansions that has not been financially committed. These scenarios only consider the use of fiberglass (FG), rock wool (RW) and cellulose (C) as the insulating materials and follow the assumptions identified previously in this report. Other sets of assumptions could provide substantial differences in the projections for completion of the retrofitting process.

Table I provides estimates of the time required to retrofit all single family and 2- to 4-family housing units that need additional insulation to meet R-19 roof insulation standards with no attempt to retrofit walls in these units. Table II considers insulating these same housing units with R-11 wall insulation as well as the R-19 roof insulation.

Table III provides estimates on the time required to retrofit only single family units that can be cost-effectively retrofitted with R-19 roof insulation and Table IV considers retrofitting these same units with R-11 wall insulation as well as the R-19 roof insulation.

TABLE I. -- EXISTING CAPACITY AND APPROVED/COMMITTED CAPACITY EXPANSION FOR SUPPLY OF INSULATION MATERIAL FOR ONE- TO FOUR-FAMILY HOUSING UNITS (ATTIC INSULATION ONLY)
(Thousand Units)

	1976	1977	1978	1979	1980
Housing inventory to be insulated at beginning of period.	25,500	23,077	18,949	13,659	7,462
New starts (one-four-family units)	1,256	1,800e	1,800e	2,000e	2,000e
Number of housing units that can be insulated (in the case of 1976, actual production) 1/	2,767 3/ 512 4/ 400 5/	3,286 3/ 758 4/ 1,884 5/	3,574 3/ 818 4/ 2,698 5/	3,880 3/ 840 4/ 3,477 5/	4,325 3/ 840 4/ 4,257 5/
TOTAL	3,679	5,928	7,090	8,197	9,422
Number of housing units that can be retrofitted after subtracting requirements for new housing starts 2/	2,423	4,128	5,290	6,197	7,422
Balance of units left to be insulated	23,077	18,949	13,659	7,462	40

1/ These figures allow for the use of 1,700 square feet of mineral wool of R-19 equivalent for attic and sidewall insulation in the new housing units, and for the use of the remainder of the mineral wool and all of the cellulosic insulation to insulate the remaining housing units' attics to an R-19 value.
2/ As stated earlier, attic insulation only. It is assumed that 1,000 square feet of mineral wool (fiber glass and rock wool) of R-19 equivalent and 800 lbs. of cellulosic loose fiber insulation is used in each dwelling unit.
3/ Fiberglass
4/ Rock Wool
5/ Cellulose

e = estimate

EXISTING CAPACITY AND APPROVED/COMMITTED CAPACITY EXPANSION FOR SUPPLY OF INSULATION MATERIALS FOR ONE- TO FOUR-FAMILY HOUSING UNITS (ATTIC AND SIDEWALL INSULATION)

(Thousand Units)

	1976	1977	1978	1979	1980	1981	1982	1983
Housing inventory to be insulated at beginning of period.	25,500	24,097	21,772	18,808	15,353	11,222	7,091	2,960
New starts (one-four-family units)	1,256	1,800e	1,800e	2,000e	2,000e	2,000e	2,000e	2,000e
Number of housing units that can be insulated (in the case of 1976, actual production) 1/								
	2,145 3/	2,674 3/	2,844 3/	3,106	3,367 3/	3,367 3/	3,367 3/	3,367 3/
	301 4/	446 4/	481 4/	494	494 4/	494 4/	494 4/	494 4/
	213 5/	1,005 5/	1,439 5/	1,855	2,270 5/	2,270 5/	2,270 5/	2,270 5/
TOTAL	2,659	4, 25	4,764	5,455	6,131	6,131	6,131	6,131
Number of housing units that can be retrofitted after subtracting requirements for new housing starts 2/	1,403	2,325	2,964	3,454	4,131	4,131	4,131	4,131
Balance left to be insulated	24,097	21,772	18,808	15,353	11,222	7,091	2,960	

1/ These figures allow for the use of 1,700 square feet of mineral wool for attic and sidewall insulation in the new housing units and the same amount of this material for retrofit purposes, and all of the cellulosic insulation to insulate the remaining housing units' attics and sidewalls to R-19 and R-11, respectively.

2/ As stated earlier, attic and sidewall insulation. It is assumed that 1,700 square feet of mineral wool of R-19 equivalent and 1,500 lbs. of cellulosic loose fiber insulation is used in each dwelling.

3/ Fiberglass

/ Rock Wool

Cellulose

e = estimate

TABLE III. --EXISTING CAPACITY AND APPROVED/COMMITTED CAPACITY EXPANSION FOR SUPPLY OF INSULATION MATERIALS FOR ONE-FAMILY HOUSING UNITS (ATTIC AND SIDEWALL INSULATION)
(Thousand Units)

	1976	1977	1978	1979	1980	1981
Housing inventory to be insulated at beginning of period.	20,700	19,207	16,482	13,118	9,16	4,532
New starts (one-family units)	1,166	1,400e	1,400e	1,500e	1,500e	1,500e
Number of housing units that can be insulated (in the case of 1976, actual production) 1/	2,145 3/	2,674 3/	2,844	3,106 3/	3,367 3/	3,367 3/
	301 4/	446 4/	481	494 4/	494 4/	494 4/
	213 5/	1,005 5/	1,439	1,855 5/	2,270 5/	2,270 5/
TOTAL	2,659	4,125	4,764	5,455	6,131	6,131
Number of housing units that can be retrofitted after subtracting requirements for new housing starts 2/	1,493	2,725	3,364	3,955	4,631	4,631
Balance left to be insulated	19,207	16,482	13,118	9,16	4,532	

1/ These figures allow for the use of 1,700 square feet of mineral wool of R-19 equivalent for attic and sidewall insulation in the new housing units and the same amount of this material for retrofit purposes, and for the use of the remaining mineral wool and all of the cellulosic insulation to insulate the remaining housing units' attics and sidewalls to R-19 and R-11, respectively.

2/ As stated earlier, attic and sidewall insulation. It is assumed that 1,700 square feet of mineral wool of R-19 equivalent and 1,500 lbs. of cellulosic loose fiber insulation is used in each dwelling.

3/ Fiberglass

4/ Rock Wool

5/ Cellulose

e = estimate

TABLE IV.-- EXISTING CAPACITY AND APPROVED/COMMITTED CAPACITY EXPANSION FOR SUPPLY OF INSULATION MATERIAL FOR ONE-FAMILY HOUSING UNITS (ATTIC INSULATION ONLY)
(Thousand Units)

Housing inventory to be insulated at beginning of period.	20,700	18,187	13,659	7,969	1,172
New starts (one-family units)	1,166	1,400e	1,400e	1,400e	1,400e
Number of housing units that can be insulated (in the case of 1976, actual production) 1/	2,767 3/ 512 4/ 400 5/ TOTAL 3,679	3,286 3/ 758 4/ 1,884 5/ 5,928	3,574 3/ 818 4/ 2,698 5/ 7,090	3,880 3/ 840 4/ 3,477 5/ 8,197	4,324 3/ 840 4/ 4,257 5/ 9,421
Number of housing units that can be retrofitted after subtracting requirements for new housing starts 2/	2,513	4,528	5,690	6,797	8,021
Balance of units left to be insulated	18,187	13,659	7,969	1,172	

1/ These figures allow for the use of 1,700 square feet of mineral wool of R-19 equivalent for attic and sidewall insulation in the new housing units, and for the use of the remainder of the mineral wool and all of the cellulosic insulation to insulate the remaining housing units' attics to an R-19 value.
2/ As stated earlier, attic insulation only. It is assumed that 1,000 square feet of mineral wool (fiber glass and rock wool) of R-19 equivalent and 800 lbs. of cellulosic loose fiber insulation is used in each dwelling unit.
3/ Fiberglass
4/ Rock Wool
5/ Cellulose

e = estimate

VI SUMMARY

Based on the information obtained from the completed survey questionnaires, and an analyses of the existing housing inventory, new construction starts, and the remodeling and building material industries, it is concluded that there are approximately 25.5 million housing units that could be retrofitted with additional insulation on a cost-effective basis. Current industry production capacity and committed expansion would provide sufficient insulation material to complete this objective by 1981 if the program is restricted to retrofitting attics only, or by 1983 if retrofitting includes walls as well as attics. If we only consider retrofitting single family dwellings, the retrofitting could be accomplished in less time. However, about 50 percent of the housing units involved are located in the South or West, where the potential for saving energy through added insulation in walls and ceilings may not be sufficient incentive for homeowners to voluntarily bear the costs. Homeowners in these areas may not participate in a national insulation retrofitting program unless the program is mandated by law or the costs are subsidized to a large degree.

FORM DIB-9002
(5-77)

U.S. DEPARTMENT OF COMMERCE
DOMESTIC AND INTERNATIONAL
BUSINESS ADMINISTRATION

BUILDING INSULATION MATERIALS

O.M.B. No. 41-S77049
Approval Expires August 31, 1977

RETURN TO: U.S. Department of Commerce
Domestic and International
Business Administration
Washington, D.C. 20230
Attention: Construction and Building
Materials Division, Room 2120

Return no later than June 10, 1977

1. *Enter name and address of company operating this plant (Principal office)*
Name of company
Street
City
State ZIP code

2. Is the above company a division or subsidiary of another company?
☐ No ☐ Yes – *If so, please give the name of the parent company.*

3. Plant name

4. Plant location *(See instructions)*

5. During the past 5 years has there been a change in the name of the company under which this plant has operated?
☐ No ☐ Yes – *If "Yes," what was the preceding name?* (Include change in company name and change in ownership if any)

The purpose of this survey is to determine maximum national capacity for the production of Building Insulation Materials

THIS REPORT IS REQUIRED BY LAW (50 U.S.C. APP. SEC. 2155). FAILURE TO REPORT CAN RESULT IN A $1,000 FINE OR ONE YEAR IMPRISONMENT OR BOTH. INFORMATION FURNISHED HEREWITH IS DEEMED CONFIDENTIAL PURSUANT TO 50 U.S.C. APP. SEC. 2155(e).

INSTRUCTIONS

Please prepare and return one copy of this report to the Construction and Building Materials Division, Room 2120, DIBA, U.S. Department of Commerce, Washington, D.C. 20230, no later than June 10, 1977. A separate complete report must be filed for each domestic establishment of your company which produces one or more of the products listed in Section I, Column (a). In addition, file a separate report for each domestic facility which is under construction at a location other than present plant facilities. Additional copies of this report form are available on request from the above address.

If you do not produce, or do not have the capacity to produce, any of these products under the assumptions stated in Section I, please enter a notation to that effect, complete the company certification section, and return the form.

File Copy. In addition to the original report form to be returned to us, there is enclosed a file copy for your records. You are not legally required to fill out or retain this file copy. While it would be a convenience to the Government for a file copy to be made and retained for reference purposes, no assurances can be provided that file copies are exempt from compulsory examination or production pursuant to legal process.

Plant location. In reporting plant location, give the street address, names of the boundary streets between which the plant lies, county, city and state. If the plant does not have a street address, the location may be specified as distance and direction from a town on a State or Federal Highway. For example, the plant location could be reported as 1281 Bradley Street, between Oak Street and Meadow Avenue, Universal City, Wilford County, Maryland, or in Maynard County on State Route 29, 2.4 miles southwest of Clearbrook, Delaware.

Estimates. If exact data are not available for any item, carefully prepared estimates are acceptable.

This survey consists of the following sections which contain specific reporting instructions.

SECTION I – 1976 PRODUCTION AND PRODUCTION CAPACITY
SECTION II – CHANGE IN PLANT PRODUCTION CAPACITY
SECTION III – WORK SCHEDULE
SECTION IV – OTHER PRODUCTS
SECTION V – LIMITING FACTORS
SECTION VI – THERMAL INSULATION VALUES OF MATERIAL
SECTION VII– REMARKS

Name of person who should be contacted if questions arise regarding this report

TELEPHONE NUMBER: Area code | Number | Extension

CERTIFICATION The undersigned company and the official executing this certification in its behalf hereby certify that the information contained in this report is correct and complete to the best of their knowledge and belief.

Name of Company | Signature of authorized official

Address of company | Title | Date

The U.S. Code, Title 18 (Crimes and Criminal Procedure), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction. The individual company information reported on this form is for use in carrying out Departmental delegated responsibilities under the Defense Production Act of 1950, as amended, (50 U.S.C. App. 2061 et seq.). The unauthorized publication or disclosure of individual company information by Government personnel is prohibited by law, and such personnel having access thereto are subject to fine and imprisonment for unauthorized disclosure.

USCOMM-DC 35307-P77

SECTION I – 1976 PRODUCTION AND PRODUCTION CAPACITY

Report all quantities in terms of the units specified.

Column (c) – 1976 Production -- For each of the products listed in Column (a) report the quantity produced in this plant during 1976.

Production for the purpose of this report is the sum of the quantities produced and consumed in this plant; produced and transferred to other plants of your company; produced and sold to other companies; and produced and held in stock.

Column (d) – Annual Production Capacity -- In order to measure equipment capability only please report annual production capacity as of December 31, 1976 for each product for which data are reported in Column (c) under the following conditions and assumptions:

1. Assume this equipment is operated on a work schedule such as would be required to attain maximum rate of production.
2. Take into account machinery downtime required for maintenance and repairs needed to sustain peak operations.
3. Take into account the use of only those building facilities and machinery which were in place as of December 31, 1976. Include idle or standby facilities which would be allocated for the production of these products under all-out emergency conditions.
4. Assume the availability of adequate labor force, production materials, supplies, utilities, etc. Report in Section V any limiting factors which would delay or prevent attainment of maximum production.
5. In estimating capacity for each line item, assume your 1976 product mix consisting of all products made with the equipment used for making the products listed in Column (a). Take into consideration apportionment of all production equipment required so that the total for all line items in Column (d) does not exceed the total capacity of the plant.

Column (e) – Time to Reach Rate of Production Reported in Column (d) -- For each of the products reported in Column (d), report your best estimate of the time interval in months between 1976 rate of production (Column (c)) and attainment of capacity rate of production. Base this estimate on your experience in hiring and training manpower, activating idle machinery, etc.

Line No.	Product (a)	Unit of Measure (b)	1976 Production (c)	Annual Production Capacity *(As of December 31, 1976)* (d)	Time to Reach Rate of Production Reported in Column (d) *(Months)* (e)
1	Cellulosic insulation Loose fill	Thous. s.t.			
2	Spray	Thous. s.t.			
3	Fibrous glass for structural insulation Loose fiber (blowing and pouring)	Thous. s.t.			
4	Building batts, blankets and rolls R-11 equivalent	Mil. sq. ft.			
5	R-19 equivalent	Mil. sq. ft.			
6	Rock or slag wool Loose fiber (blowing and pouring)	Thous. s.t.			
7	Building batts, blankets and rolls R-11 equivalent	Mil. sq. ft.			
8	R-19 equivalent	Mil. sq. ft.			
9	Perlite, expanded (loose fill)	Mil. cu. ft.			
10	Vermiculite, exfoliated (loose fill)	Mil. cu. ft.			
11	Urea formaldehyde foam chemicals (pre-mixed in liquid or dry form)	Thous. s.t.			
12	Aluminum foil reflective insulation (expansible, multi-layered)	Thous. sq. ft.			
13	Polyurethane rigid foam board (faced or unfaced, closed-cell)	Mil. bd. ft.			
14	Polyurethane, two liquids components for spray or froth application (closed-cell)	Mil. cu. ft. in place			
15	Polyisocyanurate rigid foam board (faced or unfaced, closed-cell)	Mil. bd. ft.			
16	Polyisocyanurate, two liquids components for spray or froth application (closed-cell)	Mil. cu. ft. in place			
17	Polystyrene rigid foam board Molded	Mil. bd. ft.			
18	Extruded	Mil. bd. ft.			
19	Other (Specify)				
20					

SECTION II – CHANGE IN PLANT PRODUCTION CAPACITY

A. If capacity for production of any product(s) listed in Section I has been expanded or reduced at this plant, report below the appropriate information for each product that is affected. Include any expansion or reduction that has been completed since Dec. 31, 1976.

Product *(Line No. and Product Name from Sec. I, Col. (a))* (a)	Unit of Measure (b)	Change in Annual Plant Capacity		Effective Date *(Month, Year)* (e)
		Expansion (c)	Reduction (d)	

B. If capacity for production of any product(s) listed in Section I is to be expanded or reduced at this plant, report below the appropriate information for each product that is affected. Include any expansion or reduction, whether or not committed or approved, but is anticipated to be in effect by December 31, 1979.

Product *(Line No. and Product Name from Sec. I, Col. (a))* (a)	Unit of Measure (b)	Approved or Committed			Planned but not Approved or Committed		
		Expansion (c)	Reduction (d)	Effective Date *(Mo/Yr)* (e)	Expansion (f)	Reduction (g)	Effective Date *(Mo/Yr)* (h)

SECTION III – WORK SCHEDULE

Report on line a the typical shift pattern for the production of products listed in Section I, including overtime, during 1976. On line b report the work schedule, including overtime, which you have assumed in estimating annual production capacity as reported in Section I, Column (d).

	Hours per shift	Shifts per day	Days per year
a. 1976 work schedule			
b. Work schedule assumed in estimating production capacity			

SECTION IV – OTHER PRODUCTS

Enter names of products, if any, other than those listed in Section I which were included in estimating plant capacity in Section I, Column (d)

SECTION V – LIMITING FACTORS

Report in Column A any specific production materials, supplies, utilities, labor skills, etc. which you anticipate would delay or prevent attainment of the production reported in Section I, Column (d). In Column B, report those limitations which you anticipate will limit your reaching your planned 1979 capacity.

A.	B.

SECTION VI – THERMAL INSULATION VALUES OF MATERIAL

Use your company's labeled thermal insulation coverage value as required by Federal specifications (where applicable). If there is more than one material involved, please provide data separately for each material. Report quantities in units as reported in Section I.

A. Report the quantity of the material(s) you produced that would be required to insulate 1,000 square feet of opaque wall section (no opening) in a standard frame house to add a thermal resistance factor of R-11.

Material	Quantity

B. Report the quantity needed to add R-19 insulation to 1,000 square feet of attic space, using maximum net coverage (do not apply framing correction).

Material	Quantity

SECTION VII – REMARKS

(Comments which clarify the information reported)

TABLE II

Changes in Wholesale Price Index for Insulation Materials and All Construction Materials - 1967-1976

Year	Insulation Materials 1/		All Construction Materials	
	WPI	Percent Change	WPI	Percent Change
1967	100.0		100.0	
1968	106.4	6.0	105.6	5.3
1969	115.4	7.9	111.9	5.6
1970	123.1	6.3	112.5	0.5
1971	131.7	6.5	119.5	5.9
1972	136.9	3.8	126.6	5.6
1973	137.4	0.4	138.5	8.6
1974	156.5	12.2	160.9	13.9
1975	196.2	20.2	174.0	7.5
1976	212.3	7.6	187.7	7.3

1/ Mineral wool, insulation batts, 3" nominal thickness, with vapor barrier; manufacturer to wholesaler, jobber or distributor.

Mineral wool, insulation-blowing; manufacturer to distributor or applicator, f.o.b. plant or f.o.b. shipping point.

APPENDIX C
CONSTRUCTION REVIEW

Table 1.—Conductivities, Conductances and Resistances of Selected Insulating Materials

[Design values][1]

Material	Description	Density (Lb per Cu ft)	Mean Temp F	Conductivity (k)	Conductance (C)	Resistance[2] (R) Per inch thickness (1/k)	Resistance[2] (R) For thickness listed (1/C)	Specific Heat, Btu per (lb)(F deg)
INSULATING MATERIALS:	Mineral fiber, fibrous form processed from rock, slag, or glass:							
Blanket and batt	Approx 2-2¾ in.[3]	.....	75	.....	.....	.....	[4]7	0.18
	Approx 3-3¾ in.[3]	.....	75	.....	.....	.....	[4]11	0.18
	Approx 5¼-6½ in.[3]	.....	75	.....	.....	.....	[4]19	0.18
Board and slabs	Cellular glass	9	75	0.40	.....	2.50	.....	0.24
	Glass fiber, organic bonded	4-9	75	0.25	.....	4.00	.....	0.19
	Expanded rubber (rigid)	4.5	75	0.22	.....	4.55	.....	
	Expanded polystyrene extruded, plain	1.8	75	0.25	.....	4.00	.....	0.29
	Expanded polystyrene extruded, (R-12 exp.)	2.2	75	0.20	.....	5.00	.....	0.29
	Expanded polystyrene extruded, (R-12 exp.) (Thickness 1 in. and greater)	3.5	75	0.19	.....	5.26	.....	0.29
	Expanded polystyrene, molded beads	1.0	75	0.28	.....	3.57	.....	0.29
	Expanded polyurethane (R-11 exp.) (Thickness 1 in. or greater)	1.5	75	0.16	.....	6.25	.....	0.38
		2.5						0.38
	Mineral fiber with resin binder	15	75	0.29	.....	3.45	.....	0.17
	Mineral fiberboard, wet felted:							
	Core or roof insulation	16-17	75	0.34	.....	2.94	.....	
	Acoustical tile	18	75	0.35	.....	2.86	.....	
	Acoustical tile	21	75	0.37	.....	2.70	.....	
	Mineral fiberboard, wet molded:							
	Acoustical tile[5]	23	75	0.42	.....	2.38	.....	
	Wood or cane fiberboard:							
	Acoustical tile[5] ½ in.	.....	75	.....	0.80	.....	1.25	0.30
	Acoustical tile[5] ¾ in.	.....	75	.....	0.53	.....	1.89	0.30
	Interior finish (plank, tile)	15	75	0.35	.....	2.86	.....	0.32
	Insulating roof deck							
	Approximately 1½ in.	.....	75	.....	0.24	.....	4.17	
	Approximately 2 in.	.....	75	.....	0.18	.....	5.56	
	Approximately 3 in.	.....	75	.....	0.12	.....	8.33	
	Wood shredded (cemented in preformed slabs)	22	75	0.60	.....	1.67	.....	0.38
Loose fill	Cellulose insulation (milled paper or wood pulp)	2.5-3.0	75	0.27	.....	3.70	.....	0.33
	Sawdust or shavings	8-15	75	0.45	.....	2.22	.....	0.33
	Wood fiber, softwoods	2.0-3.5	75	0.30	.....	3.33	.....	0.33
	Perlite, expanded	5.0-8.0	75	0.37	.....	2.70	.....	
	Mineral fiber (rock, slag or glass):							
	Approximately 3 in.[3]	.....	75	.....	.....	.....	9	0.18
	Approximately 4½ in.[3]	.....	75	.....	.....	.....	13	0.18
	Approximately 5¼ in.[3]	.....	75	.....	.....	.....	19	0.18
	Approximately 7¼ in.[3]	.....	75	.....	.....	.....	24	0.18
	Silica aerogel	7.5	75	0.17	.....	5.88	.....	
	Vermiculite (expanded)	7.0-8.2	75	0.47	.....	2.13	.....	
		4.0-5.0	75	0.44	.....	2.27	.....	

See footnotes at end of table.

Table 1.—Conductivities, Conductances and Resistances of Selected Insulating Materials—Con.
[Design values] [1]

Material	Description	Density (Lb per Cu ft)	Mean Temp F	Conductivity (k)	Conductance (C)	Resistance [2] (R) Per inch thickness (1/k)	Resistance [2] (R) For thickness listed (1/C)	Specific Heat, Btu per (lb)(F deg)
INSULATING MATERIALS—Con.								
Roof insulation [5]	Preformed, for use above deck:							
	Approximately ½ in.	.....	75	.....	0.72	.....	1.39	
	Approximately 1 in.	.....	75	.....	0.36	.....	2.78	
	Approximately 1½ in.	.....	75	.....	0.24	.....	4.17	
	Approximately 2 in.	.....	75	.....	0.18	.....	5.56	
	Approximately 2½ in.	.....	75	.....	0.15	.....	6.67	
	Approximately 3 in.	.....	75	.....	0.12	.....	8.33	
	Cellular glass	9	75	0.40	.....	2.50	.....	0.24
SELECTED SIDING MATERIALS:								
On flat surface	Insulating-board backed nominal 3/8 in.	.....	.....	.....	0.55	.....	1.82	
	Insulating-board backed nominal 3/8 in. foil backed	.....	.....	.....	0.34	.....	2.96	
	Asphalt insulating siding (½ in. bd.)	.....	75	.....	0.69	.....	1.46	
SELECTED BUILDING BOARD PRODUCTS:								
Boards, panels, sheathing, wood-based products	Insulating board:							
	Sheathing, regular density ½ in.	18	75	.....	0.76	.....	1.32	0.31
	25/32 in.	18	75	.....	0.49	.....	2.06	0.31
	Sheathing, intermediate density ½ in.	22	75	.....	0.82	.....	1.22	0.31
	Nail-base sheathing ½ in.	25	75	.....	0.88	.....	1.14	0.31
	Shingle backer 3/8 in.	18	75	.....	1.06	.....	0.94	0.31
	Shingle backer 5/16 in.	18	75	.....	1.28	.....	0.78	0.31
	Sound deading board ½ in.	15		.....	0.74	.....	1.35	0.30
	Tile and lay-in panels, plain or acoustic	18	75	0.40	.....	2.50	.....	0.32
	½ in.	18	75	.....	0.80	.....	1.25	0.32
	¾ in.	18	75	.....	0.53	.....	1.89	0.32
	Laminated paperboard	30	75	0.50	.....	2.00	.....	
	Homogeneous board from repulped paper	30	75	0.50	.....	2.00	.....	0.28

[1] Representative values for dry materials is selected by the ASHRAE Committee 2.4 on Insulation. They are intended as design (not specification) values for materials of building construction in normal use. For conductivity of a particular product, the user may obtain the value supplied by the manufacturer or secure the results of unbiased tests.

[2] Resistance values are the reciprocals of C before rounding off C to two decimal places.

[3] Conductivity varies also with fiber diameter . . . Insulation is produced by different densities, therefore, there is a wide variation in thickness for the same R-value between various manufacturers. No effort should be made to relate any specific R-value to any specific thickness. The commercial thicknesses generally available range from 2 to 7 inches.

[4] Includes paper backing and facing, if any. (See footnote "d" on page 363 of *ASHRAE Handbook of Fundamentals, 1972* for additional information.)

[5] Insulating values of acoustical tile vary depending on density of the board and on the type, size, and depth of the perforations. An average conductivity "k" value is 0.40.

[6] The U.S. Department of Commerce, "Simplified Practice Recommendation for Thermal Conductances Factor for Preformed Above-Deck Roof Insulation," No. R 257-55, recognizes the specification of roof insulation on the basis of the C values shown above. Roof insulation is made in thicknesses to meet these values. Therefore, thicknesses supplied by different manufacturers may vary depending on the conductivity k value of the particular material.

Extracted by permission from *ASHRAE Handbook of Fundamentals, 1972.*

Appendix III

Additional Statements and Communications Received for the Record

Statement of American Public Power Association

American Public Power Association is a national service organization representing some 1,400 local public power systems in 48 States, Puerto Rico, the Virgin Islands, and Guam.

APPA supports the implementation of the energy conservation program for existing residential buildings which is contained in Title I, Part A, Subparts 1 and 2 of the National Energy Act, S. 1469, in accord with the attached resolution adopted by the APPA membership at the Association's 1977 Annual Conference.

A number of APPA members have already initiated various programs designed to encourage energy-conservation in family dwellings, and we applaud the President's goal of bringing 90% of the Nation's 74 million homes up to minimum energy standards.

As the Committee proceeds through its hearings and mark up of this portion of the National Energy Act, there are at least six items which APPA believes should be given serious consideration.

1. As you know, public utilities which sell less than 750 million kilowatt-hours of electricity (at retail) are excluded from mandatory participation in formulating and implementing conseravtion plans. APPA believes that there is ample justification for this threshold requirement based on volume of sales. Our research indicates that approximately 55 local publicly-owned electric utilities would be covered under this program, with the remainder of the country's public power systems falling below the threshold level of sales. These systems would have sufficient resources and expertise to implement conservation programs. Conversely, many of our smaller member systems would have considerable financial and administrative problems were they required to formulate and implement such programs. However, at least insofar as APPA members are concerned, there appears to be a sincere desire on the part of smaller systems to join in this program. In fact, the APPA Executive Committee approved, in late April, a recommendation of the Association's Energy Conservation Task Force encouraging smaller public power systems that are not required to participate in the program to make every effort to offer their consumers all of the features of the energy conservation program described in Title I, Part A, Subpart 1 of the National Energy Act.

S. 1469 could be amended to enable such systems not required to participate under the Act, to nevertheless participate voluntarily where the aims of the program would be advanced. The Administrator could be authorized to established the guidelines for such participation. Such guidelines should recognize the limited resources available to the smaller systems. Since the greatest burden to these smaller systems will be the administrative costs of implementing energy conservation programs, consideration should be given to methods for minimizing such costs and, perhaps, for providing direct assistance in meeting them.

The insured loan program and financing through secondary markets should be university available to all utilities, regardless of size.

2. APPA is concerned that there may be insufficient incentives to implement this energy conservation program in rental units. Renters would be entitled to tax credits for the installation of approved energy conservation items, but such credits are of little value to low income individuals. In addition, few renters are willing to make permanent improvements in rental property. Assuming that some renters would be willing to pay for such improvements, it can be anticipated that they would be willing to do so only if they could anticipate a substantial reduction in their utility bill. Renters in multi-unit buildings served by a master meter would not experience any such direct financial benefit.

Investment tax credits would be available to landlords making qualified energy conservation expenditures. In most commercial enterprises, such tax credits, in

conjunction with an expectation of lowered utility expenditures, will probably provide a sufficient incentive for the business owners to participate in the energy conservation program. In contrast, in most residential rental situations, lowered utility bills do not directly benefit the landlord since the renters either pay their utility bills directly or utility costs are passed through in the total rental charge.

In view of this problem, APPA would suggest that Title I of the bill be amended to require the Administrator to conduct a study of the effectiveness of the program as it relates to rental units. The Administration has suggested that if the voluntary program is not effective, it would consider a prohibition on sales of homes not satisfying certain weatherization standards. If the study of insulation of rental units reveals that the program is not effective with respect to such units, then consideration should be given to prohibiting new or renewed leases on units which do not comply with specified energy conservation standards.

3. APPA suggests that consideration be given to the definition of "residential energy conservation measure" in Section 101 (11). The definition specifies that only certain items qualify as residential energy conservation measures, and provides no flexibility to the Administrator to include additional measures.

APPA has taken an active role in encouraging the utilization and installation of various energy-conserving devices. In addition to those items contained in Section 101 (11), APPA has, for instance, recommended the use of heat pumps where climatically appropriate. The energy-conserving properties of heat pumps are well demonstrated, and yet they are not included within the definition. I mention this particular item only as a specific example. Whether or not it is added to the list of approved items, it would appear prudent not to attempt to provide an exclusive list of energy conservation measures. APPA suggests that the Administrator be given the discretionary authority to add to the list, by regulation, those items either currently available or those items which, as we direct our attention and ingenuity to the task of conserving energy, may become available and are proven to be effective in conserving energy.

4. Under Section 103, utilities would be required either to loan, or make arrangements for another lender to loan, funds to residential customers which would be used to finance the installation of some insulation materials. In several states, direct financing by a publicly-owned utility would be prohibited by state constitution, statute or local charter. Section 106 of the bill attempts to overcome this problem by providing that the Administrator may supersede any law or regulation of any State or political subdivision where such law or regulation prohibits a utility from instituting a conservation program. It is not at all clear that the Administrator, under the authority of that section, could in fact issue an order which would supersede a state constitutional prohibition.

While there seems to us that there is some question about the effectiveness of Section 106, it does not appear that these state constitutional (and statutory) prohibitions pose an insurmountable obstacle. For example, the Congress could establish a National Energy Bank to serve as an alternative source of funds for loans. The bank could be established as a revolving fund within the Treasury and would place no burden on the taxpayers. Utilities prohibited from making direct loans and unable to arrange for loans for residential consumers from other conventional sources could then turn to the National Energy Bank.

5. APPA recommends that your committee consider an amendment to Part A of Title I to establish a national thermogram program. Using existing federal civilian and military equipment, such a program could both identify buildings which have heat loss problems, thereby assisting energy consumers in identifying and correcting the situation, and would reveal, over time, the effectiveness of the program to be established under Title I of this bill.

The Garland Power and Light Department, a municipal electric utility in Garland, Texas, has already conducted a thermogram program on a local basis. An article explaining the program and evaluating its effectiveness in conserving energy is contained in the January–February 1977, issue of "Public Power", a magazine published by APPA. A copy of this article is attached for your review.

6. Under Section 105, where a State regulatory authority or a non-regulated utility has not had a conservation plan approved, or has not adequately implemented an approved plan, the Administrator may order the utilities under the jurisdiction of the State regulatory authority, or the non-regulated utility, respectively, to offer to their customers a utility program which meets the requirements of the Act. The Administrator, upon a determination that such an order is not being complied with, may prohibit any rate increase by the utility in violation, or seek to enjoin the utility from violating the order. In addition, utilities

in violation of the Administrator's order are subject to a civil penalty of up to $25,000 for each violation.

It is possible that, notwithstanding a good faith effort, a utility might not be in compliance with an order of the Administrator. It would seem appropriate to amend Section 105 to provide that a good faith effort may be raised as a defense to the sanctions imposed.

UTILITY INSULATION PROGRAM

Whereas, the National Energy Act proposed by President Carter would require electric utilities with annual sales in excess of 750 million kilowatt-hours to formulate and implement residential energy conservation programs in an effort to bring the nation's 74 million homes up to minimum energy conservation standards, and

Whereas, the programs formulated under the Act would be designed to inform the utility's residential customers of the energy savings which are likely to result from the installation of various energy conservation items, and

Whereas, each utility required to implement a program would be required to offer to inspect homes, determine conservation requirements based on the inspection, provide the installation of suggested conservation measures, provide or assist in providing financing, and permit repayment of loans made directly by the utility to its customers as part of the utility's periodic bill, and,

Whereas, to assist the utilities in financing home energy conservation loans, utilities would be entitled to participate in a Federally insured loan program agreements entered into between utilities and their customers, and

Whereas, many publicly-owned utilities may be—by charter, State statute, or State constitution—prohibited from financing the purchase of energy conservation measures for installation in private residences: Now, therefore, be it

Resolved, That the American Public Power Association (1) endorses the purposes and overall framework of the residential energy conservation program contained in H.R. 6831; (2) urges the Congress to amend the bill to permit the voluntary participation of smaller utility systems under regulations promulgated by the program administrator, which regulations recognize the limited resources and capabilities of the smaller utilities; and (3) supports the implementation of the Federal insured loan program and the creation of a secondary market to purchase from the utilities obligations of indebtedness, which provisions would be available to all utilities (regardless of size) desiring to lend funds to customers for residential energy conservation expenditures and which are not otherwise legally prohibited from doing so.

(Adopted by delegate to the 1977 APPA Annual Conference, June 14, 1977, in Toronto, Canada.)

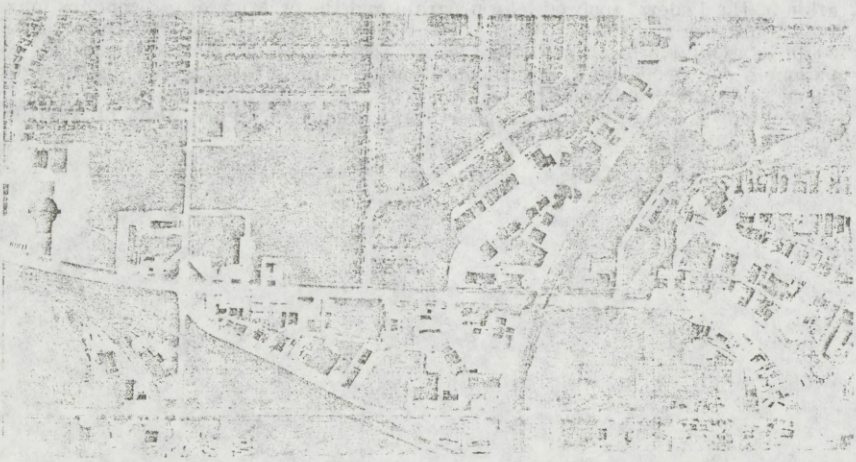


Resembling conventional aerial photographs, these views of Garland, Texas, made in the early morning hours with infrared film show heat rather than light. Paved areas and bodies of water appear as a glowing white because they retain heat, while well insulated structures or unheated buildings or parked cars are black or shades of gray. Under magnification, the infrared film can identify heat loss from individual homes or other structures. In addition to assisting energy conservation efforts, the thermal profile also can be used in land-use mapping, vegetation studies and locating leaks in water mains.

THERMAL PROFILE OF GARLAND BOOSTS ENERGY CONSERVATION

Aerial thermographic map spotlights heat losses from buildings

BY LOU CHIBBARO, *contributing editor,* PUBLIC POWER



Electric heating customers of the Garland, Texas, Power and Light Department can literally see the heat loss from their homes or other buildings, thanks to a thermal profile of the city.

Consumers who call the municipal utility about high bills are invited to the utility office where they are asked to locate their home or other building on a large photographic map. From a numerical grid on the map, a utility employee retrieves a matching video tape cartridge, plugs the cartridge into a television monitor and within a few minutes shows the consumer a picture of his home or building taken with infrared film. If the picture shows a white glow coming from the roof, it indicates heat loss which can be directly responsible for a high bill.

The video display and accompanying prints and slides are products of a thermal profile of Garland initiated by the utility to promote energy conservation by identifying sources of heat loss. The city contracted with William Hazard Associates of Austin, Texas, to develop the profile in Feb., 1976, and fly overs of the city with infrared photography were made in late February and early March.

Two types of equipment were used to obtain thermal imagery, one employing a videotape system and the other a passive infrared imaging system flown by the Texas Instruments Co. The latter was found to be superior and was used in the analyses submitted to the city in June.

The profile report describes the Texas Instruments system this way: "Energy is received by the scanner from the ground, is focused on cryogenic-cooled detectors, converted to light through the use of a light-emitting diode, and by means of a mechanically-coupled recorder exposes the photographic film in the film magazine. The film is moved at a rate proportional to the velocity and height of the aircraft, producing a continuous photographic record of the radiant energy detected."

The flights, which provided continuous images of scanned terrain along and to the sides of the flight path, were made in the early morning hours at altitudes of from 1,700 feet to 4,000 feet. The report notes that the temperature at the time was 41 degrees F., and that greater surface temperature contrasts could have been obtained if the air temperature had been 10 to 15 degrees F. lower.

Differences in surface temperature indicating possible heat loss appear on the film in varying shades of gray. Warm objects are either lighter or darker than those with lower temperatures, depending on whether a positive or negative polarity was used in the recording process.

In addition to the aerial survey, detailed analyses were made of 24 test homes with ground-level radiometry. The homes were selected by city officials as representative of housing in Garland and were analyzed for heat loss due to poor insulation, air infiltration, glass exposure, building orientation and shading.

"A pleasant surprise"

The thermal profile indicated that most buildings in Garland do not have a serious heat loss problem. This finding was "a pleasant surprise," according to George Humphries, customer services supervisor for Garland Municipal Power and Light Department and coordinator of the thermal survey. However, he noted that a number of commercial and industrial customers do appear to have moderate to severe heat loss problems, resulting in wasted energy and needlessly high electric consumption.

Photoprints from the aerial survey were scanned under magnification and structures in Garland were rated on a seven-point scale: 1. no heat loss (cold house); 2. minimum heat loss; 3. slight heat loss; 4. low heat loss; 5. moderate heat loss; 6. high heat loss; and 7. severe heat loss.

None of the single-family or multiple-family dwellings in Garland was found to have a severe heat loss. Of 21,233 single-family homes, 448, or 2.1% had low heat loss, 32 were scored with moderate heat loss and only two were reported to have high heat loss. Among multiple-family dwellings, 31, or 8% of 385, had low to high heat loss. But nearly 20% of the 959 other structures scored in the profile had low to severe heat loss: 14 (1.5%) were severe; 26 (2.7%) high; 48 (5%), moderate; and 101 (10.5%), low heat loss.

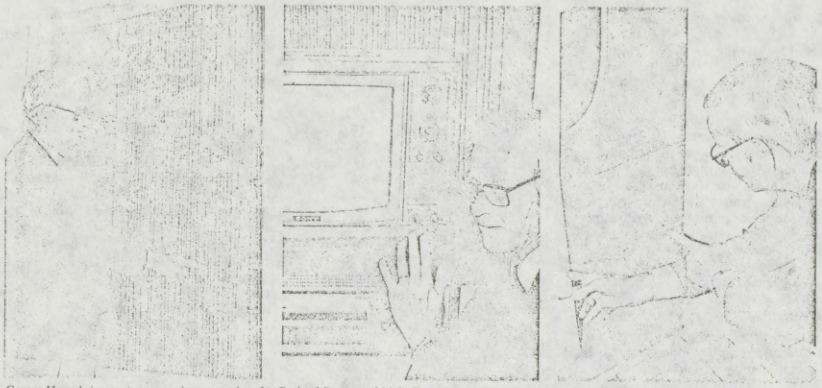
Armed with this information, the city is "making one-on-one calls to follow up on the problem structures," said public information director Dwain Howard, explaining, "We intend to do this to: reduce the customers' bills if they correct the problems; reduce the number of complaining customers; and regain credibility with our customers."

He added, "We also hope that the study will prove that the customer's life style has a great affect on his bill."

In an aerial tour of Garland via the infrared film, sidewalks, streets, parking lots and bodies of water are a glowing white since they retain heat. Structures that keep their heat confined, such as well-insulated buildings, or structures that retain no heat at all, such as unheated warehouses or parked cars, appear black or in dark shades of gray. The picture one sees is a glowing mosaic similar to a lighted city at night. But the brightness is caused by radiated heat rather than lights.

Infrared tour of city

While the roofs of most houses are dark, bright spots indicating chimney flues provide a striking contrast. Larger, more prominent light spots on the roofs of factories and warehouses are ventilating ducts. These ducts, used



George Humphries, customer services supervisor for Garland Power and Light Department, demonstrates the three steps to finding heat loss in a Garland building, using the thermal profile of the city: 1. the building is located on a map with a grid showing its location on the infrared film strips; 2. the video tape cartridge is used to display the area of the building; and 3. a visit to the building reveals an inadequately insulated wall causing wasteful loss of heat.

to vent fumes, also eliminate much of the building's heat, Mr. Humphries emphasized, pointing out that they may require twice as much heat to keep the building warm. He said the solution is to recycle the exhaust system to retain the heat while eliminating the fumes.

Some of the houses on the viewing screen showed a glowing brightness surrounding the roofs, and Mr. Humphries said that this indicates heat passing through walls or windows. He speculated that houses showing significant heat loss of this type either have improper wall insulation or large glass surfaces.

The thermal profile showed that the greatest concentration of homes with heat loss problems is in the city's older section near the downtown business district, but heat loss also was detected in varying degrees in a number of newer housing developments. In general, the older homes tended to show more heat loss through the roof than did the newer homes, indicating less ceiling insulation. Newer homes, on the other hand, were found to lose heat from the sides because of the greater use of glass for picture windows and patio doors.

The profile study also found a higher proportion of multiple-family structures with heat loss problems than single-family units, and the report speculated: "This may well reflect the fact that most apartments are still on a 'utilities included' rental or lease basis. Thus apartment dwellers are not as conscious of monthly utility bills as the homeowner or renter."

On the viewing screen, the difference between an insulated and an uninsulated warehouse is striking. The roof of the insulated structure appears dark gray, while the roof of the uninsulated building is very light, and in some cases glows, indicating massive heat loss. "I think when these industrial people find out they are spending so much money to heat the wide open spaces of the outdoors, they will be more careful," commented Mr. Humphries.

The aerial thermographic survey extended out beyond the built up area of Garland, and Mr. Humphries said, "Another important benefit of this project is in land-use mapping and vegetation studies." He pointed out that some open fields appear lighter than others, indicating the presence of water and showing which areas may be more suitable for growing crops or planting trees in city parks. Another possible use for the infrared photography's ability to detect water: locating leaks in city water mains.

Home heat loss spotted

The second phase of Garland's thermal profile study — interior infrared photographs in 24 test homes — revealed striking cases of heat loss due to cold infiltrating through ceiling joints, poorly insulated walls and joints between floors and wall corners.

Blasts of cold air, which show up on the film as black or dark gray flares, were visible in photographs taken of doors, ceilings and windows. A particularly troublesome spot, according to Mr. Humphries, is the gable under the peak of a cathedral-type ceiling. Often totally without insulation, this area can act as a sieve, draining the room's heat rapidly, he noted.

The thermographic camera often

located whole sections of walls without insulation. A well insulated wall appears white in the infrared photograph, while uninsulated areas show up as black-rectangular sections between the wall studs.

Mr. Humphries said another common problem revealed by the test homes occurs when kitchen cabinets are located on an interior wall perpendicular to an outside wall on which the roof beams are located. The joint between the outside wall and the roof often is uninsulated, permitting cold air to enter the enclosure above the kitchen cabinets. Once inside the space above the cabinets, the chilled air often finds its way through the wall separating the kitchen and an adjacent room, frequently a bathroom. "Many people are surprised to learn that this is why they were feeling a draft without knowing where the cold air was coming from," Mr. Humphries said.

The interior photographs showed that the quality of door and window frames varied by housing contractor and manufacturer, but wooden window frames and sills were found to have much less air leakage than the newer aluminum window units.

Homes with large amounts of glass surfaces clearly lost more heat than homes with less glass. However, the profile study report raises the question of whether heat loss may be offset by other advantages of extensive use of glass. "For example," the report asks, "does the energy saving resulting from the use of natural light outweigh the added energy needed to offset the higher cooling and heating loads through glass doors and windows? Will spaciousness and beauty that well designed glass exposures often provide be seriously curtailed?"

A possible solution to this problem, according to the report, is planning based on the direction in which a house faces. Surfaces facing west and east are considered more susceptible to heat loss than those facing north or south, so windows placed on south-north walls can minimize heat loss. The report observes that external shading in the summer and full exposure to the sun in the winter can minimize heat gain in summer and heat loss in winter.

The study found that defects in insulation and heat leakage in joints were common in all 24 homes tested, causing increased heating requirements in winter and greater air conditioning loads in the summer. Although insulation and quality of construction varied from builder to builder, both the interior and aerial surveys showed that the highest amounts of cold air infiltration and heat loss were in upper income houses in Garland's southeastern section. Second highest infiltration was found in middle-income, all-electric homes, and older houses in the central section had the fewest "structural defects associated with air leakage."

Mr. Humphries said that better structural design in some of the older houses was one reason for these results, but he cautioned that a larger sample would be needed in order to make a definitive conclusion about which type of house, on a city-wide basis, is better suited to retain heat.

Garland public information director Howard said the thermal profile has been extremely helpful in drawing public attention to energy conservation. The program received considerable media coverage, and a steady flow of consumers has come to the municipal utility's offices to see the results for their own homes and other buildings.

Thanks to the profile, Garland residents can see where energy loss occurs and how they can take steps to reduce their energy consumption and their utility bills. ( )

HOME HEAT LOSS PICTURED: Thermovision pictures, right, show heat loss in a Garland home. From top: exterior view shows heat loss through large windows; black flaring indicates air leakage around a door jamb; missing insulation behind a corner wall panel shows up as a black rectangle and black lines along ceiling indicate lack of insulation around a ceiling plate; and, bottom, dark areas show leakage of air through and above a suspended kitchen cabinet and along the joint between the roof boards and walls below a cathedral ceiling.

STATEMENT OF ROLAND S. JONES, PRESIDENT, CELLUTRON PRODUCTS CORP.

Mr. Chairman and members of the committee, my name is Roland S. Jones. I am President of Cellutron Products Corp. in Parsonsburg, Md. Cellutron, which was founded in 1966, manufactures cellulose insulation and presently supplies contractors and distributors east of the Mississippi. We are one of the very few manufacturers of cellulose insulation who have a Class I product on the market.

I appreciate the opportunity to submit a statement for the record on this subcommittee's hearings on Title I, Parts A, B, C, and G of S. 1469. I take this opportunity, not only as a concerned manufacturer of insulation who will be affected by parts of this legislation but also as a concerned American who looks upon the energy situation in our country as a serious problem. Too serious to allow some in the insulation industry to take advantage of American homeowners and consumers during a crisis.

The Congress must move quickly to enact a strong and effective conservation program in all areas of energy use. I agree with the President that Americans must begin to properly insulate their homes to conserve the great amounts of wasted energy in their heating and cooling. The goal of insulating 90 percent of all American homes by 1985, while improving the insulation standards in new buildings, is a large responsibility.

Though we believe it can be accomplished as an industry over an 8–10 year period, it can only be done by allowing all segments of the industry to compete without unfair restraints against some and favoritism toward one segment of the industry at the expense of another.

Though competition will intensify, it should also be a time of cooperation in the industry to meet the challenge before us.

As a manufacturer of insulation, we are particularly concerned with section 102 under Part A of Title I. Accordingly, "the Administrator shall, not later than 120 days after enactment of this subpart and after consultation with the Secretary of Housing and Urban Development and the heads of such other agencies as he deems appropriate, promulgate rules for the content and implementation of residential energy and conservation plans."

The succeeding wording of that section will have a direct effect upon standards for insulation with regard to general safety and effectiveness of the insulation manufactured. The legislation will also have a direct effect upon contractors and applicators of insulation due to the requirement for "standards of installation of any residential conservation measure."

Because of the rapidly increasing demand to insulate, cellulose insulation will play a vital role in America's energy conservation plan. The fiberglass insulation manufacturers will never be able to meet the demand alone. Many Americans will not be content to wait for 18 months to insulate their homes. Nor will they be content to wait until 1980, 1982, or 1985.

I expect there will be a sudden surge next year and the succeeding years to insulate more homes than the industry has the capacity to presently handle.

My greatest concern, however, is that the consumer not be victimized as the demand for insulation increases. With the escalating costs of fuel, the homeowner cannot afford to make a mistake on insulation. Yet, this is a time when the "fly by night" producer and the "get rich quick artist" will attempt to capitalize on the energy crisis. Some are already in operation. Others will enter soon.

As I pointed out, cellulose insulation will have an important role in our American conservation plan because it is an excellent insulating material. But there are many manufacturers that do not manufacture cellulose insulation properly and these will have an adverse effect upon the industry and the market.

There are, therefore, three areas that will need the attention of the federal government when this legislation is passed:

1. There presently exist businesses that are marketing complete insulation manufacturing plants for less than $100,000. They claim that such plants will manufacture quality cellulose insulation and for a small investment the buyer can become a wealthy manufacturer of insulation and capitalize on the energy crisis.

Increased manufacturing is definitely needed in the industry but I seriously doubt, considering our own operation, that such a small investment could ever establish a quality manufacturing system. And with the rising costs of energy, insulation manufacturers must be conscious of offering the American consumer a quality product that will do the job by reducing fuel bills and being safe at the same time.

I bring this to your attention for the following reason. It has been estimated that the cost of building a fiberglass plant costs $20–$25 million and takes between two and three years to build. The three largest fiberglass manufacturers hold patents to processes which make manufacturing much more efficient but more difficult for new entrants.

According to an FTC report submitted to a House subcommittee, it would take 10 years and $80 million to develop the technology to enter the industry with one plant.

Looking to other alternatives, would-be manufacturers arrive at the misconception that for a small investment, they can become manufacturers of cellulose insulation and can be in operation in a few months.

This attitude poses a serious threat to the cellulose insulation industry and to the American consumer who may eventually purchase a poor quality material with little or no scientific or technical knowledge behind its manufacture. Thus, the industry is in danger of infiltration by "the get rich quick" who know little about the science of cellulose manufacture.

Unfortunately, many are now in the business and I fear some consumers will suffer before the market dictates their demise, or before appropriate evidence exists to take action against them. Therefore, my first area of concern is the manufacturer of inferior cellulose insulation manufacturing equipment.

2. The second area of concern is the actual manufacturer of cellulose insulation who may be just entering the business and considers cellulosic material nothing more than ground-up paper. There exists on the market many small manufacturers, some similar to garage operations, that are churning out poor quality insulation that have low thermal resistance factors. More importantly, such operations may not be properly fireproofing the material. Since cellulose is a wood fiber product, every precaution must be taken to properly fireproof the material.

3. The last area of concern is the established manufacturer of insulation who may sacrifice quality and cut corners to increase profits.

Because of the problems we face on these three fronts and because there are currently poor quality products on the market, we propose the need for improved standard specifications.

Our concern, however, is, that should our industry be scrutinized for the purposes of improving standards, that the reputable manufacturers of cellulose insulation should not suffer. They offer a valuable source of material to help America meet its retrofit goals in a reasonable time period.

In moving to improve standards, the area most in need of investigation is the adequacy of present testing procedures for callulosic material. It is my contention that the tests need to be redesigned to result in higher standards both in thermal resistance, fire retardency, and corrisiveness. I believe existing standards, though they offer good guidelines, are too lenient.

At the same time, I do not believe that other major areas of the insulation industry such as foam and fiberglass are not above scrutinization. There also exist questions on material and application problems on these two products.

In conclusion, I would try to impress upon you that I am being open about the problems in our industry. We are doing everything possible as a manufacture to expose those problems and we urge the federal government to do the same. But at the same time I again point out that the cellulose manufacturers in this country are indispensable if the President and the Congress expect certain goals to be met.

It is a great task that we have as a nation to overcome our energy problems. But we believe Americans can rally to meet the challenge. My only hope is that Americans not be taken advantage of when they undertake retrofit measures in good faith to conserve energy.

Thank you for this opportunity to submit a statement for the record. I will be available for any questions you may have.

STATEMENT OF ALEXANDER J. KALINSKI, PRESIDENT, NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS

Mr. Chairman and members of the subcommittee, my name is Alexander J. Kalinski. I am the President of the National Association of Regulatory Utility Commissioners, commonly known as the "NARUC". I am also the Chairman of the New Hampshire Public Utilities Commission.

The NARUC is a quasi-governmental, nonprofit organization founded in 1889. Within its membership are the governmental agencies of the fifty States and of the District of Columbia, Puerto Rico and the Virgin Islands engaged in the regulation of utilities and carriers. The mission of the NARUC is to improve the quality and effectiveness of public regulation for the benefit of the American consumer.

The members of the NARUC appreciate your invitation to make their views known on Part A of Title I of S. 1469, a bill proposing the National Energy Act, which concerns energy conservation programs for existing residential buildings.

The NARUC fully supports energy conservation programs for residential buildings.

The NARUC as early as September 20, 1973, at its 85th Annual Convention in Seattle, Washington, unanimously adopted a resolution endorsing and supporting "the initiative of the Michigan Public Service Commission to encourage gas and electric utilities to offer the installation of home insulation as part of their gas service" and further resolving that "any program to better insulate American homes, which are generally under-insulated, be applicable to existing and new homes and be available to consumers on the broadest possible basis; and where technically feasible, gas and electric utilities should incur cost of service and investments to conserve, as well as distribute, existing supplies of natural gas and electricity, respectively. . . ." *Convention Proceedings*, pp. 195–197.

The NARUC position on this matter was expanded by a resolution unanimously adopted by the NARUC Executive Committee on February 28, 1974, urging "that, as a further step in the nationwide energy conservation program, the appropriate agencies of the Federal and State governments concerned with conservation of energy should promote the use of insulation in homes that are heated by oil, coal, or other fuels not subject to regulation by the State regulatory utility commission to no less degree than they have been promoting the insulation of homes heated by natural gas or electricity. . . ." *NARUC Bulletin* No. 11–1974, p. 20.

The NARUC was one of the first public bodies to endorse in principle the proposal of December 17, 1976, by William G. Rosenberg, then Assistant Administrator for Energy Resource Development of the Federal Energy Administration, that Conservation Investments by Gas Utilities be Considered a Gas Supply Option.[1]

The Southeastern Association of Regulatory Utility Commissioners (a regional affiliate of the NARUC), at its 61st Spring Congerence in Biloxi, Mississippi, on May 18, 1977, unanimously adopted a resolution requesting State commissions to direct all electric and gas utilities in their respective States: to develop cost-effective home-insulation practices appropriate for climates in their geographical areas; and to aggressively promote insulation practices by providing case-by-case assistance to consumers seeking information regarding recommended insulation levels and sources for insulation loans. "*NARUC Bulletin*" No. 22–1977, p. 21.

In view of this State activity as well as that of other individual State commissions, the NARUC does not believe that there is justification for the Federal Government to prescribe residential energy conservation plans to be offered by utilities subject to State regulation. Instead, we respectfully urge that Federal participation in this area be restricted to:

(1) The enactment of "finders-keepers" legislation which will permit a State to retain the natural gas saved by its conservation efforts, thereby providing a powerful incentive for States to promptly devise and vigorously implement conservation programs; and

(2) The enactment of Subparts 2 and 3 of Part A of title I of S. 1469 and such other legislation as is necessary: to afford tax credits to homeowners to install insulation and other approved conservation measures; to stimulate residential energy conservation loans and other forms of assistance; and to establish a date in the future beyond which residential buildings may not be sold or rented unless they are energy efficient.

However, if the Congress decides on Federal participation as proposed by Subpart I of Part A of Title I of S. 1469, we respectfully urge that it be amended to provide for close consultation between the Administrator and the State regulatory community who will bear the burden of implementation and admin-

[1] See letter from NARUC President Alexander J. Kalinski to Mr. Rosenberg, dated January 3, 1977, as reported in *NARUC Bulletin* No. 2—1977, pp. 21–22.

istration. This may be best achieved by establishment of a State Regulatory Advisory Committee as proposed in the appendix to this statement.

Rules adopted by the Administrator for energy efficient housing should only prescribe minimum standards so that they will not impair State flexibility in implementing energy conservation measures which are responsive to local conditions. We have provided an amendment for this purpose.

Also, if a State regulatory authority does not participate in the national energy conservation program in the beginning and the Administrator is forced to assume control, the Act should permit subsequent State participation by the filing of an approved plan. An amendment for this purpose is also stated in the appendix.

In conclusion, we believe that the orders of the Administrator should be subject to judicial review by an aggrieved party.

Thank you for your attention.

Appendix

The NARUC respectfully proposes the following amendments to Subpart I, Part A, Title I, of S. 1469, a bill proposing the National Energy Act.

(1) Section 102(a), page 10, line 7, is hereby amended by striking "and the heads of such other" and inserting in lieu thereof ", the State Regulatory Advisory Committee and the heads of such other Federal and State".

(2) A new sentence is hereby added at the end of Section 102(a), page 10, line 9, to read as follows: "Such rules shall not impair the flexibility of any State regulatory authority to formulate and implement residential energy conservation measures which are responsive to local conditions, so long as there is compliance with such rules which shall prescribe only minimum standards."

(3) A new Subsection (e), page 13, is hereby inserted at the end of Section 102 to read as follows:

> (e) The Administrator shall establish a State Regulatory Advisory Committee. The Committee shall be appointed by the Administrator, and shall be composed of five State commissioners from different States each of whom shall be experienced in energy conservation programs for residential buildings, nominated by the national organization of the State commissions, as referred to in sections 202(b)(2) and 205(f) of the Interstate Commerce Act, as amended, and four other members representing other interested groups. A vacancy in the membership of the Committee shall be filled by the same process of selection as applied to the last member holding such membership. The Administrator shall submit to the Committee all rules, regulations, policies, programs and amendments to same which are proposed pursuant to Subpart I, Part A, Title I of this Act and afford such Committee a reasonable opportunity to prepare a report on the feasibility, reasonableness and practicability of each such proposal. Each report by the Committee, including any minority views, shall be published by the Administrator and form a part of the proceedings for the promulgation of such proposals. In the event that the Administrator rejects the conclusions of the majority of the Committee, he shall publish his reason for rejection thereof. The Committee may propose to the Administrator, for his consideration, rules, regulations, policies and programs which are within his jurisdiction to adopt. Members of the Committee shall be compensated at a rate to be fixed by the Administrator not in excess of the maximum daily rate prescribed for GS–18 under section 5332 of title 5 of the United States Code for each day they are engaged in the actual performance of their duties (including traveltime) as members of the Committee, and pay such members travel expenses and per diem in lieu of subsistance at rates authorized by section 5703 of title 5 of the United States Code for persons in Government service employed intermittently. Payments under this section shall not render members of the Committee employees or officials of the United States for any purpose.

Justification: The opportunity for Federal-State cooperation will be maximized by the establishment of the State Regulatory Advisory Committee: Analogies to this proposal are found in the Technical Pipeline Safety Standards Committee created by Section 4 of the Natural Gas Pipeline Safety Act of 1968 (49 U.S.C.A., Sec. 1673), and the Federal-State Joint Board created by Public Law 92–131 which amended the Communications Act of 1934, as amended [47 U.S.C.A., Sec. 410(c)].

(4) Section 104(a), page 16, line 13, is hereby amended by striking "prior to one year after enactment of this Act". (Note: What advantage is there to cutting off the submission of alternative programs?)

(5) Section 105(a), page 18, line 23, is hereby amended by adding at the end thereof: "Such order shall remain in effect until such time as the State regulatory authority obtains approval of its plan under section 102(c).".

(6) Section 105, page 19, is hereby amended by adding at the end thereof a new Subsection (e) to read as follows:

(e) All approvals, disapprovals and other orders of the Administrator shall be subject to review by an appropriate United States District Court upon petition by an aggrieved party.

STATEMENT OF THE NATIONAL RURAL ELECTRIC COOPERATIVE ASSOCIATION

The National Rural Electric Cooperative Association, (NRECA) is the national organization of nearly 1,000 REA-financed, non-profit cooperatives which deliver central station electricity to some 25-million people throughout 46 states. These systems serve primarily in the sparsely populated areas of our nation. We are pleased to be able to present these comments as they relate to the electric utility portion of the President's energy conservation program, Title I of S. 1469.

We should first point out that Title I of S. 1469 does not apply to utilities which sell less than 750 million kilowatt hours per year. This limit means that few rural electric cooperatives will have to offer energy conservation programs to their consumers. In spite of this, our Association and its members have been at the forefront of energy-conservation and home-weatherization programs, beginning even before the Administration put forward its energy program.

In January of this year NRECA suggested to the Rural Electrification Administration that consumer loans under Section 5 of the Rural Electrification Act be made available for home weatherization loans. Although use of Section 5 loans did not prove feasible, Secretary Bergland found that the Farmers Home Administration could make funding available for this purpose under Section 502 of the Housing Act of 1949. Shortly thereafter at our Annual Meeting in Atlanta, Ga., our membership adopted a resolution directing the NRECA staff to give the highest priority to the development and implementation of an energy conservation program. The resolution also asked that a special committee of the membership be appointed to advise the staff in the development of this program. (A copy of the resolution is attached to this statement.) This committee has already met twice, developed and is providing us with much helpful guidance.

In May, our staff consolidated its effort in home energy conservation under one individual, who has been given the responsibility for developing and implementing a wide variety of programs aimed at assisting our cooperatives and their members in the conservation field. Additionally, we have added a summer intern who is gathering information on standards and quality control for insulation. This material will be used primarily to assist energy advisors of our member systems in meeting the needs of their consumers.

The FmHA weatherization loan program is now underway and, as of last week, 107 rural electric systems had signed up to make the program available to their members.

We are continuing our efforts—as is Farmers Home—to acquaint our consumer-members with details of the home weatherization loan program.

One problem that appears to be delaying acceptance of the program is uncertainty over whether FmHA will allow cooperatives to recover some of their costs through application of a service charge on loans they administer. FmHA had indicated it was going to amend the contract to allow such a service charge, but as yet there has been no action.

Recognizing that the FmHA program will provide loans only for those members whose annual incomes are below $15,600, the National Rural Utilities Cooperative Finance Corporation (CFC) has approved a loan program which will allow rural electrics to borrow funds for relending to members for home insulation. CFC's membership is substantially the same as NRECA's.

In addition, a number of rural electric systems have worked out arrangements with local banks or savings and loans for weatherization loans.

It should be noted that these loan programs are only some of the tools necessary for an energy conservation program.

Cooperatives in Arkansas, for instance, have formed Energy Conservation Electric Cooperative Corporation (ECECC) to provide technical assistance, financing programs and supply services relating to home weatherization programs. While ECECC is not going into the insulation field as a competitive force in any area where insulating material and supplies are available, it will be available to advise and aid homeowners in those areas.

Other examples of rural electric cooperative activity in the conservation area include the following:

Guadalupe Valley Electric Cooperative in Texas is one rural electric which has been providing insulation services for its members since 1973. This service was initiated when it was discovered that no commercial insulation company would consider coming to a rural area to weatherize homes. More than 1,000 homes have been insulated under the program.

In Tennessee, rural electric cooperatives are participating with other TVA suppliers in a program to weatherize 465,000 electrically heated homes in the next five years. Some cooperatives, such as Middle Tennessee Electric Membership Corporation, already had home insulation program for their members underway.

Blue Ridge EMC in North Carolina has begun a Home Energy Limiting Program (HELP) which provides assistance to builders in meeting strict energy conservation standards, and to homeowners wanting to upgrade their insulation.

In Illinois, Adams Electric Cooperative, got into the home insulation business in the 1950s—again in response to a public need in its area. Since then, private contractors have moved to meet the need and the cooperative has discontinued its work.

Inter-County RECC in Kentucky has had an established insulation program, with standards higher than most currently in effect, for more than 20 years. This cooperative points out that all of its electrically heated homes are already insulated to standards higher than those required under the FmHA program and, consequently, the FmHA loan program will be of benefit only to the few members which use gas or fuel oil for heat.

There are many other examples of how our member systems have been and are meeting the challenge of energy conservation. We have cited these to indicate that we are meeting responsibilities to our members and to the nation and intend to continue doing so.

In summary, we fully support all efforts toward energy conservation. We will be using the Farmers Home loan program, the CFC loan program and other loan programs as tools to assist our members in weatherizing their homes.

However, we do not believe that the establishment of mandatory programs which would require rural utilities to provide financing and other services in connection with home weatherization programs is the best way to bring this kind of service to rural areas. NRECA is concerned that mandatory programs could place tremendous burdens on many of our smaller systems which do not have the financial means of personnel to carry on extensive programs in this area. There may be other more efficient means to provide information and weatherization services to rural areas. For instance, the state farm agencies may be better equipped to undertake a thorough and effective residential energy conservation program.

We would also point out that Federal legislation could have the effect of overriding state regulatory commissions and their rulings. Each state differs in what it will allow those utilities under its jurisdiction to include in its operating costs. Two states we are aware of—Michigan and New Jersey—already are requiring utilities to have home weatherization loan programs, and a third—Kansas—has directed utilities not to hook up new homes which do not meet minimum weatherization standards.

Because of the wide disparity in regulation from state to state, we suggest that Federal legislation in the area of mandatory weatherization programs would not only be premature but perhaps disruptive of programs already underway.

Again, we appreciate the opportunity to comment on the Administration's energy conservation program. And we pledge our continued efforts in making energy conservation a top priority among our members.

Attachment.

RESOLUTION ADOPTED AT THE 35TH ANNUAL MEETING OF NRECA, FEBRUARY 20–24, 1977, ATLANTA, GA.

ENERGY CONSERVATION

The President and his top energy advisors have called for effective conservation of energy as essential to meeting the national energy crisis, some of the effects of which became dramatically visible this winter in layoffs of hundreds of thousands of workers, closing of schools and widespread deprivation.

With the national and the world's reserves of gas and oil being rapidly depleted, nothing less than a massive, nationwide effort to conserve will buy us the time to develop alternative sources of energy to supply the growing demands of our society and economy. Failure to implement all possible measures to husband our energy resources would have catastrophic consequences for our country.

The keystone to a national conservation effort must be the weatherization of the nation's homes and buildings. It is estimated that this could reduce energy consumption by 30 percent both in the form of heating and air conditioning. This also would help significantly to hold down the spiraling costs of energy to consumers.

In response to the recent request of the NRECA general manager to the Secretary of Agriculture to activate a consumer loan program to enable the nation's 1,000 rural electrics to assist their members to finance insulation and other energy saving equipment, USDA now is in the process of working out the details of a plan to provide such assistance through the combined resources of REA and Farmers Home Administration, with the latter to make the financing available.

While rural electrics always have been in the forefront of energy conservation and many systems already are carrying on successful load management programs, the energy crisis that we now face makes it imperative that we greatly expand these efforts as part of our responsibilities as producers and distributors of electricity to nearly seven-million homes in rural America. Not only will adequate insulation stretch remaining supplies of fossil fuels, but it also will help our systems to meet the growing demands for electricity which we can expect many consumers to substitute for oil and gas.

Without a source of extended financing, many of our rural electric members will not be able to insulate their homes or purchase energy saving devices. The USDA can supply this vital component. However, it will require the full and active participation of all rural electric systems working closely with their members and USDA agencies, particularly REA and FmHA, to achieve the massive savings in energy so critical to the nation's future.

The rural electric systems hereby commit themselves to cooperating to the maximum of their ability to assist their members in weatherizing their homes and in other efforts to conserve energy, and to provide their know-how and leadership to effectively implement the REA-FmHA plan.

In addition, we direct the NRECA board of directors and general manager to give the highest priority to this effort and commend them for the leadership they already have demonstrated and further we authorize and direct them to:

1. Establish a committee on energy conservation broadly representative of the membership to provide advice and guidance to insure coordination and effectiveness of membership efforts.
2. Seek whatever legislation that may be indicated to maximize the capability of rural electrics in energy conservation, including, if required, the broadening of Section 5 of the RE Act.
3. Maintain close liaison with all federal agencies involved in energy conservation.
4. Maintain close liaison with congressional committees which have responsibilities in this area, keeping them informed of problems and progress of our efforts, and seeking their assistance and support.
5. Work closely with nongovernment organizations in joint efforts aimed at conservation.

STATEMENT OF SHELTON H. BUTT, PRESIDENT, SOLAR ENERGY INDUSTRIES ASSOCIATION

The Solar Energy Industries Association is a Trade Association comprised of over 400 members engaged in various aspects of the solar energy business. We are

pleased to be given the opportunity to submit testimony in connection with hearings on Parts A and G of S. 1469, the "National Energy Act."

Subpart 1 of Part A deals primarily with energy conservation measures to be applied to existing residential structures and provides for activities by regulated and nonregulated public utilities in this area. The effect of these proposals will undoubtedly be to accelerate adoption of energy conservation measures by homeowners. Although these measures do not include solar applications and therefore, do not impact directly upon the solar industries, we wish to express our strong support for them. The Solar Energy Industries Association has consistently stated its position in favor of strong conservation measures in concert with solar applications. We commend Part A to your favorable consideration.

Subpart 2 of Part A appears to add solar energy systems, as well as conservation measures, to the purposes for which F.H.A. loan insurance may be obtained and appears to bring solar systems into the operations of the Federal National Mortgage Association. To avoid misunderstanding, it is recommended that the words "and solar energy systems" be added after the word "improvements" on line 8 of page 22 of the printed text of S. 1469, to line 21 on page 22 after the word "improvements" and to line 12 on page 23 before the word "described." These additions would make it clear that solar systems are to be included in these provisions.

Section 110 of Subpart 2 amends Section 2(a) of the National Housing Act to add public utilities to the covered financial and lending institutions when engaged in making loans or advancing credit for energy conserving improvements. Although it may be inappropriate to require that utilities conduct the activities called for in Subpart 1 of Title A, with respect to solar systems as well as energy conserving improvements, it is appropriate to permit the utilities to serve as lending institutions in the financing of solar systems. Therefore, it is recommended that the following words be added to line 1 of page 21 of the printed text after the words subparagraph (2), "and solar energy systems as defined in subparagraph (3)."

Subpart 3 of Part A of S. 1469 provides for a Federal building solar heating and solar heating and cooling demonstration program. We strongly support the provisions of Subpart 3. They meet the need to place the Federal Government in the forefront of progress towards broad use of solar energy. In addition, we recommend your favorable consideration of other pending legislation which would require the use of solar energy, where cost-effective, in Federal buildings on a continuing basis. This is the logical follow-up to the demonstration program provided for in Subpart 3.

STATEMENT OF A. J. TAKACS, DIRECTOR, GOVERNMENT AND PUBLIC AFFAIRS, WHIRLPOOL CORP.

Whirlpool Corp. endorses the minimum energy efficiency standards program for appliances proposed in the National Energy Act, with special emphasis on two crucial recommendations to help assure that the program is effective and workable: (1) total pre-emption of State minimum efficiency standards; (2) within each "type of class" of product, that sub-groups or categories be defined and minimum efficiency standards developed for each sub-group or category. We believe Sec. 201(a)(7) (lines 14 through 18, page 27) of the proposed National Energy Act (S. 1469), vaguely addresses this latter issue, but must be further amplified and expanded.

Furthermore, we recommend that minimum efficiency standards not only be established for those product types or classes specifically identified in the proposed legislation, but for such classes of products as automatic washers, dryers and dishwashers as well, if accompanied by appropriate capacity definitions. We believe that the inclusion of all such products in a minimum efficiency standards program *now* . . . will, in the long run, benefit both consumers and the appliance industry by providing a common manufacturing and marketing base for all major home appliances built and/or sold in the United States.

PREEMPTION

Whirlpool urges that the Committee favorably consider amendments to the National Energy Act (Part B) reflected in Appendix A relating to the establishment of sub categories within product types and adding automatic washers,

clothes dryers, and dishwashers to the mandatory minimum energy efficiency standards program.

With regard to the issue of state energy efficiency standards, Whirlpool supports total pre-emption of any state standard differing from those developed by FEA—without exempting any state (i.e., California) that may have standards in effect upon enactment of this bill. It has been suggested that EPCA pre-emption language allow states with efficiency standards promulgated prior to enactment of the Act to remain effective until federal standards are published, assuming that FEA fails to grant relief to manufacturers. This provision places a significant burden on manufacturers and on interstate commerce. During the interim period between the promulgation of California's (or any other states') efficiency standards and the establishment of federal standards, Whirlpool would have to comply with potentially more stringent and conflicting state standards for approximately one to two years. We seriously question any attempt to allow state standards to remain in effect, even on a temporary basis, creating the burden on manufacturers of having to build products for multiple markets (i.e., complying with differing state standards).

Whirlpool contends that this "interim period" places an unreasonable burden upon appliance manufacturers as we would be required to incur additional materials and tooling costs—ultimately passed on to all consumers regardless of state residence—to meet an individual state efficiency standard. Even if Whirlpool is successful in petitioning for pre-emption, we would still face an "interim period" of costly compliance if we desire to do business in that particular state.

To dramatize the significant differences between California and FEA in administering their respective appliance energy conservation programs, there are currently substantial differences in test procedures to measure energy consumption of refrigerators and freezers. In FEA's proposed plan, a credit would be allowed for "power saver" switches in determining energy consumption. However, the State of California has disallowed the credit in their program—thus resulting in higher measurement levels of energy consumption. This creates a particularly unreasonable and uneconomic situation.

Whirlpool therefore recommends that the Senate pre-emption provisions recognize the following:

1. Supersede all state energy efficiency standards that may be in effect upon enactment of the National Energy Act.

2. Preclude states from superceding FEA standards once they become effective.

The basic point of our discussion is essentially that if the concept of pre-emption of state energy efficiency standard is accepted, it is then inconsistent to exempt a single state on the basis of already having their own standards already in effect.

STANDARDS FOR SUBGROUPS OF CATEGORIES

Whirlpool envisions the benefits of minimum efficiency standards for categories within product classes as follows:

A. Ensures that differing consumer market segments will not be penalized for products that may be eliminated by the establishment of a single minimum standard for a product class.

B. Enables manufacturers to more effectively plan product lines, tool manufacturing plants and make capital investments in order to produce an efficient line of appliances.

C. Recognizes that differing products within product classifications are identified by the energy consumed as related to the amount of work performed.

The establishment of differing levels of minimum energy efficiency standards by category within appliance "types or classes" is both necessary and justifiable. Each product type, as described in Section 322(a) (1), (2), (3), (4), (6), (9), and (10) of EPCA will be individually discussed, focusing upon the technical need for differing minimum standards. Additionally, potential problem areas, such as excessive price/cost inflationary impact and difficulty in providing products for all segments of the consumer market, will be discussed, as appropriate.

Laundry equipment

Automatic washers can best be categorized by capacity (i.e., compact, intermediate, regular and large) as each is developed to satisfy a differing product need in the marketplace. For example, differing family unit sizes—young marrieds, singles, families with many children—have differing requirements relative to the size (or capacity) of the automatic washer needed to do the job. It is critical to recognize that for each category of washer, the amount of energy consumed must

be related to the amount of work performed. That is, it is more efficient to launder a load of clothing from a family of six in a large capacity automatic than in a compact machine. Conversely, a single person would be making inefficient use, from an energy consumption standpoint, of a regular size automatic when a compact unit may be more appropriate.

Another consideration that must be noted is the physical storage space that may be available. Most apartment units do not provide either the space or the plumbing required for regular or large capacity machines. Therefore, the limitations make the compact washer the only size alternative available to the consumer.

Whirlpool urges the Committee to recognize the need for establishing differing minimum standards based upon the direct relationship between machine capacity and the amount of energy consumed. Without the stipulation that product categories be identified by capacity and/or utility, consumers may, in the short run, lose the freedom of choosing the size machine most appropriate to their family configuration—therefore possibly increasing the amount of energy consumed in order to do a given amount of laundry.

The above comments can be equally and appropriately addressed to clothes dryers and dishwashers. Like automatic washers, these products must also have differing minimum standards categories so as not to restrict marketplace choice or increase energy usage.

Appendix B contains Whirlpool's recommendations for defining product categories within product classes.

Refrigerator-freezers/freezers

Fundamental design differences and product capacity must be recognized in establishing differing minimum standards in order to avoid unnecessary reduction in the utility of refrigerator-freezers required by consumers.

Appendix C includes not only a discussion of proposed product categories, but also dramatizes the relationship between capacity and energy consumption.

Air conditioners

Differing size (capacity) characteristics of air conditioners must be considered when establishing energy efficiency minimum standards. As pointed out by the FTC in their testimony before the House Energy and Power Subcommittee, more energy is consumed by an air conditioner that is too large for a consumer's need. Conversely, energy consumption can also be excessive if the unit is too small for the size of the room to be cooled. For instance, if a single standard is established for air conditioners, possibly eliminating large BTU models—necessitating reliance upon a smaller unit to do the job—performance (cooling) would be marginal. In other words, the product will consume energy without optimum performance return.

The definition of categories would also have to recognize performance-related feature differences between heat pumps and regular air conditioners. With heat pumps, the heating side of the unit can be inefficient from an energy consumption standpoint depending upon mildness or severity of the winter season.

Specific category energy efficiency standards recommendations are contained in Appendix D.

Kitchen ranges and ovens

Three basic range and oven categories—cooktops, ovens, and microwaves—are needed because of the intrinsic design differences and utilities of these categories. For example, each category is designed to accomplish a certain task (i.e., boiling water, cooking a roast, etc.). Minimum standards should therefore be developed for each category so as not to dictate extremely complex efficiency rules for range units made up of several category combinations. The configurations could include—oven, cooktop/oven, cooktop, microwave/or two ovens, cooktop.

LEAD-TIME TO COMPLY WITH ENERGY EFFICIENCY STANDARDS

Given the lead-time that Whirlpool would face to tool a new product line in order to comply with an energy efficiency standard, we are concerned that S. 1469 reflect a minimum time frame before which a standard could become effective. It is our suggestion that effective dates of standards should be both reasonable and practical, established individually for each product. We recommend twelve months minimum between the time FEA promulgates the final standard and the effective date of that standard. Further, FEA should be directed to solicit comment on lead-time projections as a part of their rulemaking process.

In summary, Whirlpool hopes the above product narratives effectively dramatize the need for an amendment to Sec. 201(a)(7) which would define product categories beyond "kind of energy" consumed. The common thread woven into our discussion of product categories within classes has been one of relating energy efficiency to the amount of work performed by an appliance of a given capacity. We invite the Committee's attention to Sec. 321(a)(5) of EPCA which defines "energy efficiency"—the term 'energy efficiency' means the ratio of the useful output of services from a consumer product to the energy use of such product—". We imply from this definition that the intent was to ensure that the energy consumed by an appliance should be related to its capacity, performance, and performance-related feature differences.

Whirlpool offers its cooperation in the development of this program—just as we have been involved for over three years with various Government agencies in programs to improve appliance energy efficiency.

Any program for new energy efficiency will be costly and inflationary—however, our above recommendations would help provide both an effective program and a lessened inflationary impact.

We offer these comments to help assure a successful program of energy conservation.

APPENDIX A

Energy Efficiency Standards

"Sec. 325 (a) (1) (A) The Administrator shall, by rule, prescribe an energy efficiency standard for each type (or class) of covered product specified in paragraphs (1) through (13) of section 322 (a).

"(6) (A) A rule prescribing an energy efficiency standard for a type of covered product (or class) shall specify a level of energy efficiency higher or lower than that which otherwise applies (or would apply) for such type or class for any group of covered products which have the same function or intended use if the Administrator, in his discretion, determines products within such group--

"(i) consume a different kind of energy from that consumed by covered products within such type (or class), or

"(ii) have a performance-related feature which is not part of other products within such type or class, justifying a higher or lower standard from that which applies (or will apply) to other products within such type (or class). In determining under this subparagraph whether a performance-related feature justifies the establishment of a higher or lower standard, the Administrator shall consider such factors as the utility to the consumer of such a feature, the capacity of the product resulting from, or which constitutes, such feature, and may consider such other factors as he deemsappropriate.

"(B) Any rule prescribing a higher or lower level of energy efficiency under subparagraph (A) shall include an explanation of the basis on which such higher or lower level was established.

APPENDIX B

1. AUTOMATIC WASHERS

Capacity	Basket Volume - Cubic Feet*
A. Compact Capacity	1.0 cu. ft. or less
B. Intermediate	Over 1.0 cu. ft. but less than 1.6 cu. ft.
C. Regular Capacity	1.6 cu. ft. but less than 2.3 cu. ft.
D. Large Capacity	2.3 cu. ft. and over

11. CLOTHES DRYERS

Capacity	Drum Volume - Cubic Feet	Load Size
A. Compact Capacity	3.0 cu. ft. or less	3#
B. Intermediate	Over 3.0 cu. ft. but less than 4.4 cu.ft.	3#
C. Regular Capacity	4.4 cu.ft. but less than 6.5 cu.ft.	7#
D. Large Capacity	6.5 cu.ft. and over	7#

111. DISHWASHERS

Capacity	Rack Area - Square Feet
A. Compact Capacity	Less than 4.8 sq. ft.
B. Regular Capacity	4.8 sq.ft. but less than 7.0 sq. ft.
C. Large Capacity	7.0 sq. ft. and over

*Measured at high water level in basket, agitator in place.

APPENDIX C

I. Proposed Categories

A. Refrigerators - Manual Defrost

A basic type product generally made only in smaller sizes the frozen food space is normally operated at 10-15° F., which is proper for only short term storage. The cooling surfaces collect frost and must be manually defrosted -- generally with warm air or water. Practical energy rating test procedures do not permit testing with a layer of frost on the cooling surfaces, but it can be shown that substantial frost will cause warming of the food and/or increased power consumption. This product is generally low priced and provides basic refrigeration to low income people, but it does not provide long term storage or meet the needs of those who can not or will not defrost manually.

B. Combination Refrigerator-Freezer - Partial Automatic Defrost

A combination refrigerator-freezer in which the frozen food compartment must be manually defrosted, but the fresh food compartment defrosts automatically. The freezer compartment does provide 5° F. temperatures for long term food storage. Practical energy rating test procedures do not permit testing with a layer of frost on the cooling surfaces, but it can be shown that substantial frost will cause warming of the product and/or increased power consumption.

C. Combination Refrigerator-Freezer - Automatic Defrost

A combination refrigerator-freezer in which all refrigerated surfaces are automatically defrosted. These products ensure that cooling coils remain relatively free of frost and at optimum efficiency. The freezer compartment provides 5° F., long term food storage. The rate of cooling of warm foods is faster in an automatic defrost combination than in other products ---helps perserve food quality.

D. Chest Freezers - Manual Defrost

A food freezer in which the top opens as a door. The walls of the interior are refrigerated surfaces. These must be manually defrosted. Practical energy rating test procedures do not permit testing with a layer of frost on the cooling surfaces. It can be shown that substantial frost on the cooling surfaces will cause warming of the food and/or increased power consumption. The product provides 0° F., long term food storage.

E. Vertical Freezers - Manual Defrost

A food freezer in which the front face opens as the door. This product requires less floor space, permitting it to be installed in homes where a chest freezer would not fit. The shelves are refrigerated surfaces and must be manually defrosted. Like the chest freezer, it provides long term storage--but performance will be affected by frost build-up.

F. Vertical Freezers - Automatic Defrost

Like the Vertical Freezer - Manual Defrost, it uses less floor space than the chest. In addition, the cooling coils are automatically defrosted to ensure that they remain relatively free of frost and at optimum efficiency. The rate of cooling of warm foods is faster -- helps perserve food quality.

II. Capacities

Consumers have differing storage capacity needs depending upon family size, working spouses shopping habits, etc. It can be shown that larger refrigerators and freezers are more efficient (cubic feet per kilowatt hour per day) but would consume more power than smaller products.

For example:

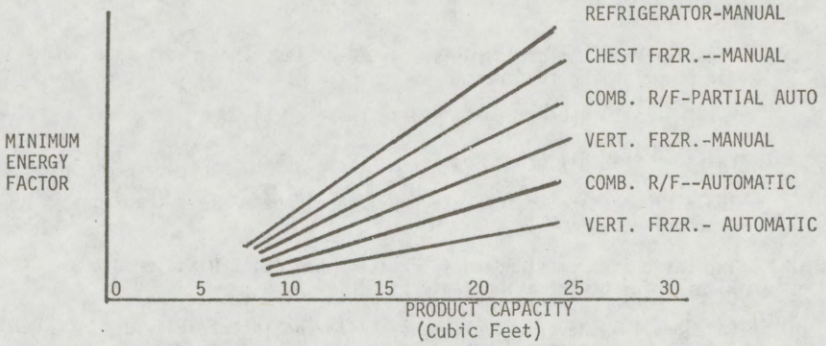
	10 cubic feet	20 cubic feet
Power Consumption (Kwh/Mo.)	90*	140*
Efficiency (Energy Factor in Cu. Ft./Kwh/Day)	4	5.1

*Products meeting California 1979 Requirements.

Note that for a family requiring 10 cu. ft., the smaller product would be better. However, a family requiring 20 cu. ft. would consume less power with one 20 cu. ft. model than with two 10 cu. ft. models.

III. Recommendation

For the reasons stated above, we recommend that minimum standards for refrigerators and freezers should take the form illustrated below.



NOTE: Actual positioning of lines is not significant, as this is drawn for illustration only.

APPENDIX D

We believe the number of categories will depend on the value established for the minimum standard:

1. The basic minimum standard is 8.4 EER or less and credit is allowed for power saving features:

   Category 1 -- Reverse cycle models (heat pump).

   Category 2 -- All other models.

   The minimum standard for Category 1 should be 2% less than for Category 2.

2. The basic minimum standard is greater than 8.4 EER and credit is allowed for power saving features:

   Category 1 -- Reverse cycle models with cooling capacity of 20,000 Btu/hr or less.

   Category 2 -- All other models with cooling capacity of 20,000 Btu/hr or less.

   Category 3 -- Reverse cycle models with cooling capacity greater than 20,000 Btu/hr.

   Category 4 -- All other models with cooling capacity greater than 20,000 Btu/hr.

   Category 2 would meet the basic minimum standard and Category 1 would be 2% less. Category 4 would be 8.4 EER minimum and Category 3 would be 8.2 EER minimum (2% less).

STATEMENT OF MECHANICAL CONTRACTORS ASSOCIATION OF AMERICA, INC.

Mr. Chairman and members of the subcommittee, the Mechanical Contractors Association of America, known by its initials MCAA, appreciates this opportunity to present our statement in support of S. 1469.

MCAA is a construction trade association of about 1500 firms, employing approximately 125,000 persons. Almost all of the firms employ union labor.

A mechanical contractor builds systems that move fluids, both liquid and gas. This includes the fabrication and installation of heating, ventilating, air conditioning and process piping systems, and further encompasses service, maintenance and the testing, adjusting and balancing of these systems. Our work affects multi-residential, commercial, public and industrial facilities. The equipment our members install is the principal user of energy in buildings, and energy is the key to our industry. Consequently, conservation and effective use of our nation's fuel resources are and have been concerns of MCAA. We have extensive experience and know-how in this field. Even before the OPEC oil embargo in 1973, MCAA had formed an Energy Conservation Committee to inform and assist our members in the areas of energy conservation.

MCAA has considered Title I, Part C of S. 1469. Based on our study of the Bill, we believe that the legislation can make a significant contribution toward the nation's energy conservation effort. For that reason, the Bill and its objectives have MCAA's backing, although we do have two particular areas of concern, which we will cite later.

In support of the bill, we offer these comments:

1. It provides incentives and assistance to encourage energy conservation in buildings used by significant segments of the public across the country.

2. The bill is timely. There is an immediate and urgent need for an extensive energy conservation program nationally. The severe 1976–1977 winter has made much of the population aware of that fact.

3. The bill will bring into operation some of the extensive talent, know-how and technology for energy conservation presently available in the business, industrial and public sectors.

4. By demonstration and positive results, the program can have effects reaching into the private sector.

5. The money invested in energy conservation now can pay significant dividends in the future by helping assure future supplies of energy.

6. Productive, worthwhile work and jobs will be created now, with potential for increasing such work in the future, as energy conservation moves to additional buildings and construction in the private sector.

7. The program can help verify the most promising energy conservation alternatives for buildings in various regions of the nation.

8. A demonstration of what one type of incentive can accomplish may encourage the Congress to provide other types, such as tax incentives, to encourage intensive energy conservation by homeowners, business and industry.

And now to turn to our concerns and recommendations regarding this bill.

MCAA's principal concern is that the specific listing of permitted energy conservation measures is too restrictive and would not allow those that would bring the best results for energy conservation. If Federal funds authorized are to be expended for the most efficient energy conservation and fuel savings, it is essential that the measures allowed not be restricted by a "laundry list", as Section 391 now does.

For example, under the present wording of the Bill, the use of such energy conservation measures as heat recovery devices, replacement of obsolete or inefficient heating systems, installation of partitioning and reduction of glazed area, would not be permitted. Yet some of these and other practical measures might produce better results than some measures listed in the bill. Consideration of the engineering involved shows the reasons.

From an engineering standpoint, measures that provide conservation in existing structures generally fall into four major categories:

1. Changes to make building operating procedures more efficient.
2. Improvements in temperature control systems.
3. Increasing the efficiency of the mechanical equipment.
4. Making the building structure more energy efficient.

For most buildings, applying any one of the above, using properly selected options under that category will make a significant contribution to reducing fuel consumption. A combination of two or more, again carefully selected, can promote additional savings.

Costs of the work and its effectiveness will vary so widely that the most promising alternatives can be determined only on a case-by-case basis. Such variables as the age of the building, occupancy patterns, climatic region and architectural style will have an effect.

As a general rule, the costs and economic feasibility of the alternatives for energy conservation will follow the pattern of the schematic graph shown on Enclosure 1.

It is important, also, that the bill not preclude energy conserving measures, including future developments and technology, that may provide the greatest return on investment in terms of fuel economies for a particular building.

For example, case studies reflecting costs and potential savings in an actual school building have been developed by the American Association of School Administrators (AASA) in conjunction with a demonstration project with 10 schools. I assume this data will be made available to your Committee by AASA. A review of that AASA study shows that some energy conserving measures selected for certain of these schools would be prohibited by this bill. Yet, they would be effective energy savers, and were considered prudent investments by the engineers who conducted the study.

MCAA recommends that the definition of "energy conservation measure" in Section 391 be broadened by adding the words "but is not limited to" after the word "means" in subparagraph (2). This simple change will permit concentration on obtaining best results—that is, the method for achieving the greatest cost-effective energy savings . . . rather than designating and restricting the means by which energy is conserved.

We also have some reservations regarding the method of administration through the various States. It is certainly recognized that the States are closer to the problems of the institutions involved, as well as the needs, general style of regional architecture and climatic conditions. However, there is a question as to whether the administration of these funds in such a manner would dilute or diminish the amount of dollars that would finally be translated into specific energy conservation projects. We are aware that a bill in the House of Representatives, H.R. 5996, which proposes energy conservation funds for public schools only, provides for centralized administration. We suggest that the method of administration for Part C be carefully considered to assure that the greatest amount of cost effective energy conservation work is performed in the various institutions.

Finally, we suggest that the Federal monies authorized for grants be phased in increasing increments during the first 2–3 years, rather than equal amounts each year. It takes some time for engineering studies, analyses, recommendations and other factors to be accomplished properly. We believe that it will be more efficient and practical for a smaller amount of funds to be available during the first year, with increases up to a maximum level within three years. In other words, the money available should allow a phase-in of the program. The total amount authorized need not be diminished. Even allowing for inflation, we believe the "increasing step" level of financing will be a better investment than the same level each year.

Another area of significant interest to this industry is the matter of incentives. MCAA contends that with proper incentives, U.S. business and industry can solve our energy conservation problems in new and existing buildings, since adequate knowledge and technology for energy conservation is already on hand. Part C is an incentive for schools and hospitals. What has been and still is lacking is sufficient motivation and capital for others to implement energy conservation extensively. As one way of providing more significant motivation, MCAA has developed a unique plan for tax incentives to homeowners, business and industry for energy conservation. It has a tremendous advantage of providing tax credits to homeowners and commercial and industrial owners based on the amounts of fuel saved, rather than capital outlays alone.

Since your Subcommittee does not deal directly with business tax matters, details on this will not be covered at this time. Suffice to say, that MCAA's tax incentive plan is relatively simple and as we believe, workable. We have attached a one-page explanation of this plan as part of this statement (Enclosure 2).

SUMMARY

To summarize, the Mechanical Contractors Association of America supports S. 1469 for the following reasons:

1. The legislation is timely and needed.

2. It provides incentives that will produce positive results in energy conservation to institutions vital to our nation.

3. It will be a stimulus to the economy and create jobs.

4. A demonstration of what one type of incentive can accomplish may encourage the Congress to provide other types, such as tax incentives, to encourage energy conservation by homeowners, business and industry.

MCAA recommends that:

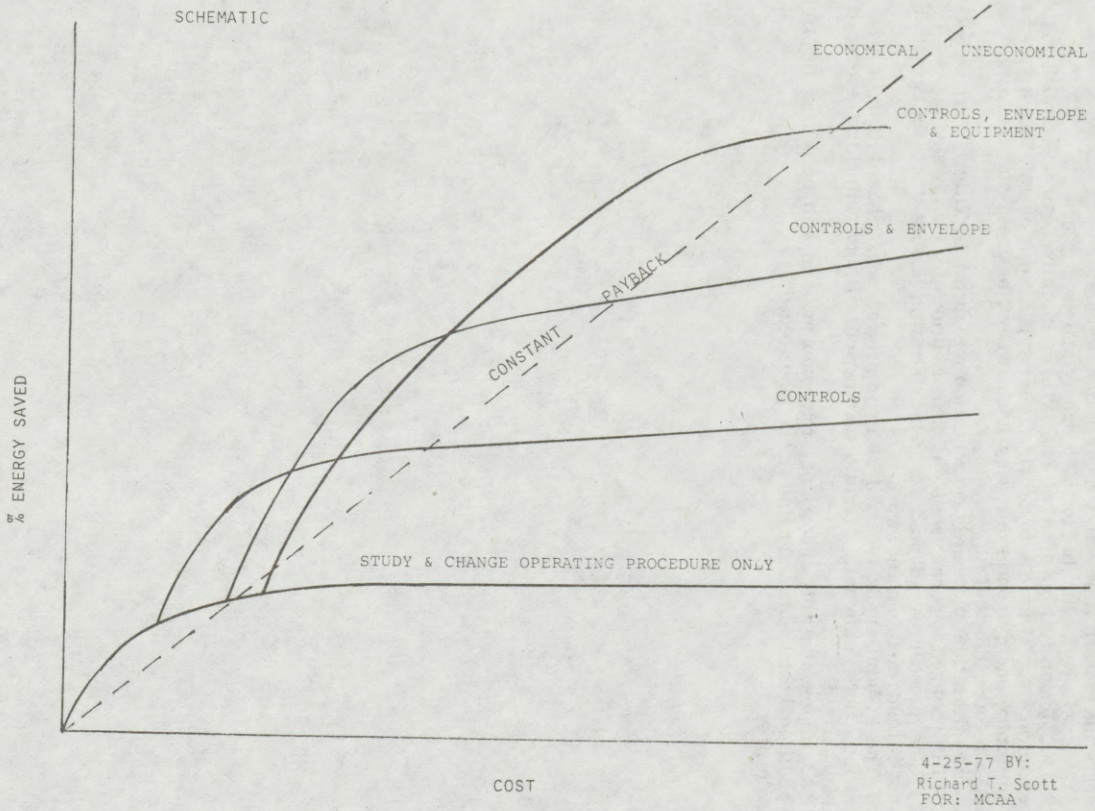
(*a*) The definition of "energy conservation measures" in Title I, Part C, Section 391 be changed to permit a wide choice of options for energy savings.

(*b*) The procedures adopted for administration assure that the greatest amount of funds go into actual work.

(*c*) The Federal funds required be appropriated on a phased-in basis with increasing amounts annually over a 3 year period, without changing the overall total authorized.

MCAA appreciates this opportunity for comment, and will be peased to provide additional comments and details as may be needed.

Enclosures.


SCHEMATIC
ECONOMICAL
UNECONOMICAL
CONTROLS, ENVELOPE & EQUIPMENT
CONTROLS & ENVELOPE
CONSTANT PAYBACK
CONTROLS
STUDY & CHANGE OPERATING PROCEDURE ONLY
% ENERGY SAVED
COST
4-25-77 BY:
Richard T. Scott
FOR: MCAA

ENCLOSURE 1.

MECHANICAL CONTRACTORS ASSOCIATION OF AMERICA PROPOSED TAX CREDIT FOR ENERGY SAVINGS IMPROVEMENTS IN EXISTING COMMERCIAL/INDUSTRIAL BUILDINGS

ASSUMPTIONS

1. There is no shortage of know-how in the U.S. private sector to achieve substantial actual energy savings, given proper incentives.
2. The incentives should be based on the principle of predictable results in energy savings.
3. The principles should be sufficiently broad and flexible to encourage full use of the inherent ingenuity of the U.S. private sector.
4. Energy savings can be accurately forecast by a qualified Registered Professional Engineer.
5. A certification by a Registered Professional Engineer will be as valid for the returns as a certification by a Certified Public Accountant.
6. The concept of tax incentives should be based on the principle that for each barrel of oil saved, an equivalent tax credit is given. (The equivalent can be applied to other fuels.)
7. The per barrel value of oil would be determined annually by the Secretary of Commerce based on world wide prices and value of saving to the national economy.

METHOD

Objective

To encourage energy saving investments through tax incentives, based on the total amount of fuel saved and/or the capital expenditure involved.

1. Provide 12 percent investment credit for the installation of energy saving equipment. Further, provide addition tax credit for amount of electrical-generated energy or petroleum-generated energy (including natural gas) saved. Suggested method:

   a. Total annual energy savings based on energy saving property be calculated and certified by a Registered Professional Engineer.

   b. Convert savings to oil equivalent barrels of energy.

   c. Determine actual dollar value of a barrel of oil (Secretary of Commerce).

   d. Allow tax credit to be equal to number of oil-equivalent barrels saved, multiplied by dollar value of barrel of oil.

   e. Allow the calculated credits to be applied annually for a specified number of years.

2. As an alternative, eliminate investment credit for energy saving equipment and apply principles of paragraphs 1a, b, c, d, e as tax incentives.

STATEMENT OF EDWARD J. CARLOUGH, GENERAL PRESIDENT, SHEET METAL WORKERS' INTERNATIONAL ASSOCIATION

We appreciate this opportunity to express the position of the Sheet Metal Workers' International Association on those sections of S. 1469, The National Energy Act, now under consideration by this Subcommittee, and to present our support of S. 805, which would stimulate commercialization of energy conservation and solar energy through federal low-interest loans and grant programs. We believe that such direct federal financial assistance to homeowners is an essential component of an effective national energy strategy.

Our active interest in solar energy and energy conservation is two-fold. It is a tragic irony that although the need to conserve fossil fuel energy and to fully utilize solar energy is so crucial, thousands of sheet metal craftsmen—whose skills can make energy-efficient homes and buildings a reality—stand idle.

The cost to our nation in wasted energy and in lost wages is staggering.

President Carter warned in his Energy message that heating and cooling systems are one of the areas "where we waste most of our energy."

There is a second kind of waste. Right now, 30,000 union sheet metal workers are out of work. Based on a national average hourly wage of $8.08 and a 40-hour work week, an incredible $9.7 million per week in buying power, taxes, and family security is being lost to our economy—to say nothing of productivity.

We can and must cut these losses now. We can save energy. But to get started, we must get sheet metal workers off the unemployment rolls, and back on the job.

Energy conservation and solar energy will have a large impact on unemployment. The Stanford Research Institute estimates that one-fourth of the dollars invested in solar heating and cooling alone will go to the labor costs of installation. In addition, many jobs will be created in fabrication of collectors, storage tanks, ducting, and the allied equipment necessary for a solar installation. A massive commitment to residential energy conservation will create thousands of jobs for which sheet metal workers have the unique training and skills.

For example, a 1976 FEA Report examined the benefits of conservation in some 34,000 private homes. The work included installing insulation and automatic thermostats and retrofit or replacing furnaces. By 1985, the study concluded, 1.2 billion cubic feet of gas would be saved, the homeowners would save $1.7 to $2.3 billion in heating costs, and 487,000 jobs would be created. If three simple conservation techniques in only 34,000 homes can create almost half a million jobs, the potential for conserving energy and generating jobs is enormous.

We must stress that there is no shortage of skilled manpower to install conservation measures and to build solar installations. In fact, our journeymen sheet metal mechanics have been fully qualified for many years to both fabricate and install solar equipment. Members of the Sheet Metal Workers' International Association are ready to go to work.

We have already taken these steps:

In 1975 we commissioned the Stanford Research Institute and the Mitre Corporation to make studies of the impact of solar development and energy conservation on our industry. Copies of these studies have been made available to every Member of Congress. The Mitre study forecast that 2.4 million single family residences could be using solar energy by 1985 to 1990. We are gratified that the President recognized this figure is attainable and has made proposals to back this commitment.

Through our National Training Fund, we have developed an excellent film on solar energy, and we have aided ongoing solar research.

We have been educating our membership to the positive savings of energy conservation and solar energy development.

In March of this year, our union sponsored a Solar Conference here in Washington attended by Congressmen; Congressional staff; national media; and representatives of labor, industry, and public interest organizations.

Sheet metal workers have already put the solar promise to work by installing solar heating systems throughout the country. Practicing what we preach, our Local 55 on Long Island converted its Apprenticeship Training School from electric to electric-boosted solar air heating. Solar energy carried about 45 percent of the heating load in our worst winter on record. Local 80 in Detroit has just installed an all-air solar heating system in its new training school facility.

Looking ahead, the U.S. Energy Research and Development Administration estimates that solar energy will provide 7 percent of our total energy needs by 2000 and up to 25 percent by 2020.

Meanwhile, "no country uses as much energy as is contained in the sunlight that strikes just its buildings.", according to the recent Worldwatch Report, "Energy : The Solar Prospect."

We cannot afford to wait. Apathy and the wait-and-see attitude are our worst enemies.

Having acquainted you with our earnest commitment to a sound, national energy plan and with the skills and manpower that union sheet metal workers will provide to implement the plan, I wish to express our position on specific portions of the bill.

Our union urges early passage of the President's legislative proposals in Part A, Subpart 2, for opening a secondary market for residential energy conservation and solar energy loans through the Federal Home Loan Mortgage Corporation and the Federal National Mortgage Association. This will strongly encourage private lending institutions—many of which have been conservative in their view toward solar loans—to make capital available at reasonable interest rates. We also support the increased funding levels for the residential weatherization program which will not only save energy but also real dollars for those hard-pressed, low income Americans who can least afford high energy bills.

Advancing the effective date of mandatory standards for new residential and commercial buildings from 1981 to 1980 under Subpart 3 will be extremely effective in reducing our energy deficit. Currently, almost 25 percent of all energy used in this country is consumed by heating, ventilating, air conditioning

and related systems. It makes no sense to continue to build energy-guzzling "white elephants" when we have the knowledge to make them energy-efficient. We, therefore, endorse the authorization of funds to assist the states in this effort.

With regard to the President's proposal, Subpart 1, to make public utilities the major vehicle for accomplishing residential energy conservation, we have strong reservations.

The first is the question of allowing utilities even more of a monopoly in the residential energy field than they now command. If utilities install energy conservation measures with their own untrained or hastily retrained personnel, they would drive many independent contractors and small businesses which normally perform such work out of business—with attendant losses in jobs.

Second, the utilities' vast capital would permit large-scale purchases of insulating material and conservation equipment, creating a lock on the supply and killing off private competition. Shortages are already forecast as early as this Fall without the utility program's potential effect. As utilities move inevitably into the solar installation field, they could again, by their capital, dominate the market.

Third, if they acquire solar equipment manufacturing firms, we will be faced with the same monopolistic problems we now have with the large oil companies—suppressing of competition, price maneuvering, market manipulation, and dedication to the status quo. And, they would have control over our use or non-use of an inexhaustible source, energy source.

Solar energy is free. It is the equipment and installation to convert that energy to our use that requires an investment. However, if the utilities control the equipment and the installation, we may end up, in effect, leasing the rays of the sun.

The administration's proposal to require utilities to offer a conservation program and loans to homeowners is the first step down this road. The bill does not provide adequate safeguards against deceptive practices, anticompetitive activity, price fixing, excessive profit taking, or unreasonable interest rates. The state regulatory commissions will have the responsibility for watchdogging these activities. Yet, we know historically that their record in rate regulation and consumer protection has been poor.

All utility consumers will pay for this program because administrative overhead will be passed on through rate increases. There is nothing in the legislation to prevent it. Those who have already invested in energy conservation or who plan to do so with their own money will be penalized. Carrying it one step further to solar, the Southern California Gas Company has requested a rate hike from the State Public Utility Commission to fund a 5-year solar demonstration grant. The Center for Science in the Public Interest forecasts that if the rate increase is granted, consumers will pay about $11 million for the utility to install 315 solar heating units. That translates to a cost of $34,920 per unit—which gives you some indication of how Southern California Gas is promoting solar and profiting from it. The consumer is the loser. In contrast, an April 4th article in "U.S. News and World Report" discussed 22 solar installations in Denver that cost between $8,000 and $9,000 each.

Last year, Colorado utilities asked for and received a rate structure change so they could charge solar homes a higher rate for electricity than conventional homes. Why?—To compensate for decreased electricity usage. Reason finally prevailed, and the decision was reversed. But this is a forerunner of what consumers can expect if the utility program provisions of S. 1469 are passed.

The Center for Science in the Public Interest has just published a revealing analysis of the potential dangers of public utility involvement in insulation and solar programs. We are supplying copies for the Subcommittee's consideration along with our testimony.

There is a better way to spur residential energy conservation and speed up use of solar. We support S. 805, which would provide low-interest loans and grants to homeowners; community, neighborhood, and non-profit groups; and low-interest loans to small businesses for installation of conservation measures and solar space and water heating systems.

The concept is straightforward. It would make the energy savings of conservation and solar available to many low and middle-income Americans who otherwise could not afford the initial investment . . . it would provide dividends to the Nation as a whole in the form of reduced energy consumption . . . it would create thousands of jobs for sheet metal workers, other trades, and employees in related businesses, supply companies, and contracting firms . . . and it would prevent the public utilities from digging even deeper into the consumer's pocketbook.

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Americans are rapidly becoming educated about the energy crisis. Many are already suffering seriously from the high costs. All of us want to do our constructive part to help solve the problem. And, we are looking to Capitol Hill to provide the answers as to how. Passage of S. 805 at the full level of funding called for in the bill would be a strong incentive to individual action and a clear statement that Congress is committed to bringing order out of chaos and a measure of help to the average American.

If we are to have an effective national energy program, we cannot put a significant portion of that program in the hands of the utilities that have generated poor energy planning, inverted rate structures, blackouts, brownouts, and pollution—and will short-circuit the use of solar energy unless they can put a price on sunlight.

Moving now to Part C of the President's proposals, we strongly endorse the energy conservation program for public and non-profit schools and hospitals which would authorize federal grants to the states for up to 40 percent of the project costs of conservation measures or solar installation.

We all remember the wholesale school closings across the Nation last winter and the dire straits that hospitals were placed in because of fuel shortages. Utility costs for these facilities are rising faster than money can be found to pay them—money that would be better spent on much-needed equipment, supplies, and personnel as well as upgrading the quality of basic education and medical care. If these are not reasons enough to pass this legislation, we can turn to an example in our own backyard.

The newly built Terraset Elementary School in Reston, Virginia was designed to include a solar heating and cooling system, heat reclaim and recycle systems, and a host of other energy-saving architectural and engineering features. But, was financial aid for the energy innovations in this school forthcoming from our Federal government? No. ERDA refused to grant funds. The benefactor for this energy-efficient project was, ironically, the Saudi Arabian government.

Although we are pleased that Arabian generosity allowed this example of solar energy at work for education to finally become a reality, we should also be ashamed that a public school system within a few miles of Capitol Hill had to seek money for energy savings in the Middle East.

During the dedication ceremonies at Terraset, Prince Saud said, "If this project can help us convince the American public of some of the advantages of improving (energy) efficiency, it will have been an effective grant if nothing else happens." We suggest that energy efficiency is not going to happen in our budget-poor schools and hospitals unless Congress gives them some help. We, therefore, urge early passage of this legislation.

Under Part G, we wish to express our support for Subpart 3, the demonstration of solar heating and cooling in Federal buildings. Representatives of our Union have testified in behalf of similar measures during both the 94th Congress and the current Session.

We noted with optimism that the House of Representatives recently directed the Architect of the Capitol to determine the feasibility of installing solar in the House Office Buildings. President Carter has ordered a similar examination of the White House. We commend these efforts to start the solar ball rolling, and hope that Congress will underscore the importance of making an immediate national commitment to solar energy by authorizing funds for installation in Federal buildings.

The market for this non-polluting, inexhaustible source of energy is still in its infancy with all the attendant growing pains. Government agencies are still studying, researching, and developing solar to death. The result is many consumers are hesitant to buy a product that the government is still avidly "testing".

Yet, more than 10 million solar units have been sold in Japan and tens of thousands are in use in Israel. During the early 1950's in this country, some 50,000 solar units were heating hot water in Miami alone. Most of the basic solar patents in the U.S. were issued in the "roaring" twenties.

This legislation will graphically demonstrate to the American homeowner and businessman that solar technology is out of the laboratory and ready for their roof—and it will yield impressive savings in fossil fuel consumption and in operating costs.

Still another barrier to widespread solar acceptance are the well-publicized, high unit costs associated with some government-funded solar R&D installations.

Costs, in some cases, so high, they are totally out of touch with the reality of the commercial market. But these high costs do scare away potential customers.

At the same time, a recent ERDA analysis found that, taken over its life-cycle cost, solar can now compete economically with electricity, and ERDA predicts it will be competitive with gas or oil within the next five years. A solar system installed in a new home now would pay for itself through lower fuel costs within fifteen years.

In this regard, the federal buildings program would be essential to demonstrate life-cycle-costing of solar systems. But, it will require a massive effort to educate the consumer who is used to buying on the basis of the initial price tag alone.

The Sheet Metal Workers recommend passage of this innovative legislation with a funding authorization at least equal to the level requested.

In the current examination of energy policy alternatives and economic considerations, it must be remembered that Congress alone can make the hard, legislative choices that will determine the outcome of our energy future and the fate of our unemployed.

The energy proposals we support, without question, will cut our losses in energy and in jobs. They will save fossil fuel, yield a more favorable balance of payments, create thousands of jobs, and contribute to our energy independence.

We recommend early and decisive approval of this legislation.

[Reprinted from "Energy Costs and Energy Conservation Programs in Colleges and Universities: 1972–73 and 1974–75," a publication of American Council on Education, Higher Education Panel Reports No. 31, April 1977.]

Highlights

National Estimates

- Between the 1972-73 academic year (which is FY 1973) and the 1974-75 academic year (FY 1975), total energy costs at colleges and universities rose from $555 million to $944 million, a 70 percent increase.
- Over the same period, total energy consumption decreased by 6 percent from 4.25 billion therms to 4.01 billion therms. Adjusted for changes in the number of square feet serviced, the decrease was about 12 percent.
- Overall energy costs averaged 13.1 cents per therm in 1972-73 and 23.5 cents per therm in 1974-75, a 79 percent increase.
- The greatest increase in per-unit cost during the survey period occurred for oil (163 percent), followed by coal (126 percent). The per-unit cost of natural gas and purchased electricity increased less drastically (64 percent and 57 percent, respectively).
- In both years, natural gas provided 45 percent of total therms consumed; electricity and oil each provided about 20 percent; and coal, slightly more than 10 percent. The relative consumption of both oil and coal decreased slightly over the period.
- Electricity accounted for 55 cents of each energy dollar spent by higher education in 1974-75; oil and natural gas, about 18 cents each; and coal, 6 cents.

Regional Estimates

- Institutions in the East and South experienced the greatest increases in total energy costs—94 percent and 84 percent, respectively. Smaller increases occurred in the Midwest (48 percent) and the West (40 percent).
- The per-unit cost of energy increased most at institutions in the East (101 percent), from 16.5 cents to 33.2 cents per therm. The South averaged a 97 percent increase (from 11.6 cents to 22.9 cents); the Midwest, 58 percent (from 12.4 cents to 19.6 cents); and the West, 50 percent (from 11.6 cents to 17.5 cents).
- Over the two-year period, the per-unit cost of both natural gas and coal rose most sharply in the South (100 percent and 185 percent, respectively).
- Oil was the predominant source of energy in the East (providing nearly 50 percent of the total therms consumed), whereas natural gas was the predominant source in the West (providing about 65 percent of total therms consumed), in the South (over 50 percent), and in the Midwest (just under 50 percent).

Cost Per Student

- Nationally, the energy costs per student increased 57 percent between 1972-73 and 1974-75, from $79 to $124.
- The East experienced the greatest per-student increase in energy costs: from $103 to $184, a 78 percent rise.
- The smallest increases occurred in the West, where energy costs were lowest: from $57 per student in 1972-73, to $71 in 1974-75, a 25 percent increase.

Cost Per Square Foot

- The energy cost per square foot of institutional space serviced increased 57 percent from 1972-73 to 1974-75, from 27.6 cents to 43.4 cents.
- The largest increase occurred in the East: from 31.8 cents per square foot in the earlier year to 57.6 cents per square foot in the later year, an 81 percent increase.
- Institutions in the West experienced the lowest increase: from 24.3 cents to 31.5 cents per square foot, a 30 percent increase.

Consumption Per Square Foot

- Nationally, total energy consumption dropped over the period from 2.11 therms per square foot to 1.85 therms, a 12 percent decline. (These figures represent adjustment for changes in the amount of space serviced.)
- Institutions in the East reported a 9 percent reduction in energy consumption per square foot; figures reported by institutions in the other three regions more closely resembled the national figure.

Proportion of Current Fund Expenditures (CFE)

- The median percentage of CFE that went for energy rose from 2.7 percent in 1972-73 to 3.6 percent in 1974-75.
- Institutions in the East spent the largest proportions

of CFE for energy (3.1 percent in the earlier year and 4.4 percent in the later year), and those in the West spent the smallest proportions (2.2 percent in the earlier year and 2.1 percent in the later year).

Reliance on Specific Types of Fuel

- Institutions dependent primarily on oil reported an 82 percent increase in total energy costs (from $132 to $239 million); those dependent primarily on coal, a 79 percent increase (from $51 to $92 million); and those dependent on natural gas, a 46 percent increase (from $267 to $389 million).
- Colleges and universities relying chiefly on oil experienced a 116 percent increase in their per-unit cost of energy, from 15.3 cents to 33 cents per therm.
- Institutions relying chiefly on either natural gas or coal experienced per-unit cost increases of 62 percent and 86 percent, respectively, bringing their total energy cost up to 19 cents per therm for each type of fuel.
- In 1974-75, oil-dependent institutions spent $194 per student for energy, those relying primarily on coal paid $151 per student, and those relying on natural gas paid $108 per student.

Type of Institution

- The increase in per-unit cost of energy was about the same—80 percent—at each of the three institutional types: doctoral-granting institutions and other comprehensive universities and colleges; other four-year colleges; and two-year colleges.
- In 1974-75, on average, doctoral and comprehensive institutions paid 21.5 cents per therm, other four-year colleges averaged 23.9 cents per therm, and two-year colleges paid 30.4 cents per therm.
- Two-year colleges reduced their total energy consumption by 15 percent; doctoral and comprehensive institutions, by 5 percent; and other four-year colleges, by 3 percent.
- When adjustments are made for space changes during the survey period, the reduction in energy consumed turns out to be greater: 26 percent at two-year institutions, and about 10 percent each at the two other categories of institutions.
- On a per-student basis, differences in the amounts of energy used varied widely among the three institutional types. In 1974-75, the energy used per student averaged about 750 therms at doctoral and comprehensive institutions, 570 therms at other four-year institutions, and about 200 therms at the two-year colleges.

Conservation Measures

- Three phases of conservation effort were defined: *quick fix*, involving obvious measures that achieve significant energy savings at small cost; *refit*, involving engineering analysis and moderate amounts of capital investment; and *systems convert*, involving major changes in systems design, usually requiring substantial capital investment.
- Most of the 533 institutions responding to the survey have adopted those quick fix measures which could be implemented unilaterally by the physical plant manager. Few institutions have adopted those quick fix practices requiring the cooperation of the institutional community.
- While over half the respondents believed that the various refit measures listed should be implemented further, few reported significant progress in implementing such measures.
- One in five responding institutions has upgraded its boiler/chiller plants by converting to alternate fuel sources; 17 percent have begun to automate their power plants.
- In general, doctoral and comprehensive institutions have led other types of institutions in implementing conservation measures.
- Almost half of the responding institutions reported holding interruptible gas contracts; of these, 44 percent experienced some curtailment during 1974-75.

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS,
Washington, D.C., June 23, 1977.

Hon. J. BENNETT JOHNSTON, Jr.,
Chairman, Subcommittee on Energy Conservation and Regulation, Committee on Energy and Natural Resources, U.S. Senate, Washington, D.C.

DEAR SENATOR JOHNSTON: On behalf of the National Society of Professional Engineers, an association of nearly 75,000 members engaged in virtually every aspect of engineering practice, I am writing to urge the further review of a bill your subcommittee is currently considering, S. 1469, the "National Energy Act." The comments, which follow, refer in large part to Part C of the subject bill, "Energy Conservation Program for Schools and Hospitals." We ask that this statement be included in any published report the subcommittee plans, and that we have the opportunity to testify at any hearings that may be scheduled on S. 1469 in the future.

At the outset, the Committee should be made aware of the apparent proliferation of plans and proposed plans being imposed on the states. We support the general concept of state management of programs where possible and where that is the most effective delivery method. That may be the case in this instance as well, but there are at least two state plans already mandated under existing legislation. They are found under Section 362, Part C, Title III, Energy Policy and Conservation Act (P.L. 94–163) (State Energy Conservation Plans) and under Section 432, Part B, Title IV, Energy Conservation and Production Act (P.L. 94–385) (Supplemental State Energy Conservation Plans). Furthermore, in response to Title V, P.L. 94–39, Energy Research and Development Administration is called upon to establish an Energy Extension Service which invites "the Governor of each state through competitive procurement to submit a plan for the conduct of energy extension service activities as described in Section 504 of this title throughout such state including provisions for appropriate technical support within such state of such activities, to disseminate information and provide advice and assistance to individuals, groups and units of state and local government . . ."

Part C of the bill under consideration would, if enacted, invite the Governor of each to submit a "proposed state plan" through which the grant program would be implemented within that state.

There has been a large volume of regulations, proposed and final, issued by the FEA implementing programs mandated by existing legislation. Enactment of the subject title would generate additional regulations. It would seem that these state plans could be coordinated or perhaps combined and thereby enable both the states and the Federal agencies more efficient delivery mechanisms. One of the results could be a reduction in the volume of regulations produced and imposed.

Each step—publication of proposed regulations, development of guidelines, application development, application analysis, etc.—carries with it time delays. Such delays frustrate both the potential benefactors of the program and the program itself. We cannot overemphasize the need to limit red tape.

With respect to the content of Part C, we would first direct your attention to Section 391, Definitions, specifically to the definition of "energy conservation measure". The definition contained in the bill is a listing of examples of what may be "energy conservation measures" under certain circumstances. There are several deficiencies in this approach. It does not, for example, include every possible energy conservation measure and thereby would, presumably, eliminate nonlisted measures from consideration. Inclusion on the list implies that the measure is in fact a conservation measure when there are instances in which a so-called energy conservation measure may be just the reverse. The listing also has limited references to energy consuming systems, i.e., heating, air conditioning, lighting, etc. There may be circumstances when a major system overhaul is the most economic approach.

Based on the above, we are recommending that the following definition be inserted under Section 391(2), "The term 'energy conservation measure' means any modification of a building or structure which results in a reduction in energy consumption by the entire building or structure."

It is our belief that such a definition would permit the flexibility necessary to insure an effective program.

We also believe that the guidelines proposed for state plans call for the inclusion of inappropriate and unnecessarily restrictive data. For example, we strongly recommend deletion of the word "installation" from Section 304(a), Section 304(a)(1) and Section 304(a)(1)(A) and (B). The basis for this recommendation is simply that it is quite possible that considerable savings in energy may be

instituted without installation of equipment per se. By removing the word "installation" the program is not restricted to physical equipment and would permit provision of funds for a full scale energy analysis of a school or hospital facility the result of which would be recommended revision in operation systems control sequences and maintenance procedures. Such recommendations may lead to substantial savings and avoid the necessity of major expenditures. In light of the fact that limited resources are available ($300,000,000 is not a massive Federal commitment), it seems appropriate that the program provide for the wisest and most efficient utilization of those funds possible. This is especially true when one considers the fact that 60 percent of the cost would be assumed by the applying institution—public or private.

We also doubt the inclusion of Section 304(a)(1)(C), requiring the states to provide "an estimate of the energy savings anticipated for each type of proposed project", would in fact generate the kind of information it anticipates. To achieve the results implied by this requirement would demand a significant financial investment by the state in preparation of its plan.

What is required is technically achievable but costly. It is unlikely that the states will commit the necessary resources to such an analysis. This is particularly true in light of the fact that such expenditures are not reimbursable under terms of the bill.

We would offer a single comment on an item not included under Section C, that being Title 1, Part A, Section 101(11) in which residential energy conservation measures are defined. In the instance of residential measures we believe it appropriate that the measures themselves be listed rather than rely on a broad definition which we recommended for inclusion in Part C. However, we are concerned that the list which is set forth in the present bill is incomplete. For example, such a list should also include external shading devices and attic fans. There are perhaps others and we would be pleased to provide a revised list for consideration.

Returning to Part C, while we support the concept of the bill and applaud its intent, we are concerned that the mechanisms spelled out in it are such that implementation will be inhibited. Such mechanisms must be as efficient, effective and nonrestrictive as possible to effect economic and energy savings at the earliest possible date.

We would be happy to work with your subcommittee toward these objectives and would welcome the opportunity to discuss legislation in this area further with you or your staff.

Sincerely,

PAUL H. ROBBINS, P.E.,
Executive Director.

SEARS, ROEBUCK AND CO.,
Washington, D.C., June 24, 1977.

Hon. J. BENNETT JOHNSTON,
Chairman, Subcommittee on Energy Conservation and Regulation, U.S. Senate, Washington, D.C.

DEAR SENATOR JOHNSTON: On May 11, 1977, Anthony J. Kloska, Group Manager of the Range and Combustion Section of Sears, Roebuck and Company, testified before the Energy and Power Subcommittee of the Interstate and Foreign Commerce Committee in opposition to the proposed amendments to the Energy Policy and Conservation Act of 1975. Sears, having carefully reviewed its position in formulating its more detailed statement on The National Energy Act, Title I, Part B, as promised, wishes to reaffirm its opposition to the establishment of mandatory minimum energy standards.

Sears has consistently and vigorously supported efforts in this country to reduce overall energy consumption and to improve the energy efficiency of energy-using appliances. Thus, Sears actively participated in the voluntary energy efficiency programs developed by the Department of Commerce several years ago. These programs, involving energy efficiency labeling of appliances, were aimed at increasing consumer awareness of energy consumption levels in different categories and models of appliances. Subsequent to this voluntary action, the Energy Policy and Conservation Act of 1975 was enacted, thereby mandating the essential elements of the Department of Commerce's voluntary programs. Sears supported the passage of the Energy Policy and Conservation Act.

Sears believes the Energy Policy and Conservation Act, enacted less than eighteen months ago, should be afforded the opportunity to achieve its purpose of

reducing the energy consumption of designated appliances, rather than be drastically amended as proposed in Section 201 of S. 1469.

In contrast to permitting industry to attain energy efficiency targets by 1980 by improving the average efficiency of certain appliances as the current law permits, the proposed amendments would result in the issuance of mandatory minimum energy efficiency standards by the Federal Energy Administration. Sears does not believe that such minimum standards would be the best way to implement a workable appliance energy efficiency program.

If mandatory minimum standards were to be imposed, some appliance models would inevitably be eliminated from the marketplace, thus substantially restricting a selection of products from which the consumer could choose. Primarily to avoid this result, Sears has favored the achievement of lower energy consumption by requiring sellers to improve the average efficiency of all products in a given class. Through such an averaging approach, appliance marketers could continue to offer a number of models with a variety of features at a range of prices, thereby continuing to satisfy the varied needs and desires of consumers. In short, an averaging approach of balancing out sales by selling low cost, low energy efficient appliances as well as high cost, high energy efficiency appliances would satisfy the diverse needs of consumers while simultaneously achieving an overall gain in energy efficiency. The President's proposals, as contained in Section 201 of S. 1469 would eliminate this flexibility in achieving energy efficiency and conservation.

To further illustrate the negative impact of minimum efficiency standards on consumers' freedom of choice, attached herewith is a copy of Sears' statement to the California Energy Resources Conservation and Development Commission on proposed California efficiency standards on refrigerators, freezers, and air-conditioners. This statement outlines the models and features which would be either wholly eliminated or adversely affected by California's proposed standards. In addition, it includes estimates of resulting price increases on covered products.

The end result of the loss of flexibility of achieving energy efficiency standards by adhering to minimum standards rather than using an averaging method would be a consequential significant reduction of product choice of consumers. This would be a serious financial blow to low-to-moderate income consumers. Such persons would either have to invest a significantly higher proportion of their incomes to new appliances subject to minimum energy standards or else retain their old, high-level energy using appliances! There is, additionally, the problem of particularly unique items, such as small apartment air-conditioners, in which factors such as size and portability are crucial, being withdrawn from the retail market altogether. Again, consumers would be the losers.

An averaging approach has the benefit of establishing an incentive to design a very efficient "top of the line" unit to offset the less efficient "low end of the line" unit. In contrast, if minimum standards were established, it is quite likely that they would soon become maximum figures that manufacturers would strive toward to be competitive. This is likely since it usually costs more to improve a performance characteristic such as energy efficiency, and, without customer demand for higher efficiency, the incentive for such a characteristic would be lacking. Hence, the net result would actually be veritable stagnation of energy efficiency standards!

Another important reason for maintaining a low-to-high efficiency product mix is to be found in the replacement market. If there are physical limitations involved in replacing certain products, it would be in the best interest of the consumer to be able to replace that item of similar dimensions which could be installed in the existing connections. Air conditioners, water heaters, and gas ranges are examples of products which could have both size and utility limitations. For example, if a standard were to require elimination of pilots of all gas appliances, this could create a hardship on some consumers since it would become necessary to install electrical outlets where none existed in order to accommodate an automated electric ignition.

In addition to the above considerations, there are other difficulties in the proposed amendments to the Energy Policy and Conservation Act. For example, what would actually be the minimum standards on products? This is not a trifling question: if standards were set too high they might not even be technologically achievable and, if too low, would be of no value at all! Even more importantly, in an overall determination of economical and technological feasibility, exactly how much weight would each of the enumerated factors be given? The provisions of Section (a)(1)(B)(5) are devoid of any such reference to weight. These

questions, and scores of others like them, certainly need to be addressed and adequately resolved.

Sears reiterates that it actively supports the efforts of this Congress and the Administration to tackle the energy problems confronting this Nation. Sears believes that such efforts, however, should proceed in the most reasonable and feasible manner possible. For this reason, Sears believes that mandatory minimum energy efficiency standards should not be established.

Our thanks to you and the Subcommittee on Energy Conservation and Regulation for this opportunity to restate Sears' view on the National Energy Act, Title I, Part B.

Respectfully submitted,

SEARS, ROEBUCK AND CO.,
PHILIP M. KNOX,
Vice President, Government Affairs.

Enclosures.

STATEMENT OF ANTHONY J. KLOSKA, GROUP MANAGER OF THE RANGE AND COMBUSTION SECTION, SEARS, ROEBUCK & CO., ON THE NATIONAL ENERGY PLAN, "PART B—ENERGY EFFICIENCY STANDARDS FOR APPLIANCES" BEFORE THE ENERGY AND POWER SUBCOMMITTEE OF THE INTERSTATE AND FOREIGN COMMERCE COMMITTEE, U.S. HOUSE OF REPRESENTATIVES, MAY 11, 1977

My name is Anthony J. Kloska. I am the Group Manager of the Range and Combustion Section of the Sears Laboratories. Appearing with me today is Mr. Phil Knox, Vice President of Sears, Roebuck and Co. who is in charge of Sears Governmental Affairs Office in Washington, D.C. We appreciate the opportunity to present our recommendations on the proposed amendments to the Energy Policy and Conservation Act of 1975.

We received notification of this hearing late last week with the receipt of Appendix I issued by the FEA and have not had an opportunity to review the entire text. Therefore, our comments will be brief. However, we would like to reserve the right to submit, at a later date, a more detailed summary of Sears' position.

To begin, I would like to restate some energy usage information as it pertains to household appliances. It is essential to note that the total amount of energy consumed for residential purposes is less than 20 percent of all energy consumed by the Nation as a whole. After subtracting the energy consumed by large appliances such as water heaters and furnaces, this figure is reduced to probably less than 5 percent. Therefore, an overall gain of 20 percent energy utilization on all appliances would result in only an approximate 1 percent savings of all the energy used in this country. Moreover, the improved efficiency for new products would not even be realized for approximately 15 years since millions of existing products would continue in operation.

These figures are meant to put the appliances into proper perspective with respect to the overall energy problem and should not be construed to mean that Sears is against improving appliances with respect to energy usage. We are not. We are concerned, however, that appliances seem to be receiving more attention than their relatively low energy consumption warrant. To illustrate this point, a clothes washer in a typical household of four could operate for one full year on the energy consumed in burning 3½ gallons of gasoline. Yet it would obviously be more beneficial to the energy problem, and more acceptable to the average American household, to conserve 3½ gallons of gasoline than it would be to sacrifice doing completely without the clothes washer.

We have a number of specific suggestions which we should like to make as follows:

(1) Sears does not agree that mandatory minimum energy standards is the best way to implement an efficiency program. Rather, Sears would prefer to have a program that averages the energy from the low cost, less efficient units to the higher cost, more efficient units. This would be in the best interest of the consumer, particularly low income families, yet still achieve overall energy savings. It is feared that if minimal standards were set, some consumers would be deprived of the choice of buying a low priced, less efficient product that better suits their needs.

While this lower cost, less efficient relationship would not be true for all appliances, it is most certainly true for many products. Air conditioners are a good example. In addition, there is also the strong possibility that if minimum efficiency standards are adopted it could soon become the *maximum* efficiency

standard since there would then be little incentive to improve minimum levels. In contrast, use of an average energy figure ranging from low cost, low efficiency units to higher cost, more efficient units *could* result in an overall energy gain.

(2) The amendment of the Act requires that all products using 150 Kwhr/yr. or more be covered under this Amended Act. While this is a major improvement over the recently proposed level of 100 Kwhr/yr., Sears would prefer the original limit of 200 Kwhr/yr. I would like to point out that the lower annual usage figures would require efficiency figures for such products as electric blankets, coffeemakers, frypans, etc. This would be more of a nusiance than an aid to the consumer and yet would only have an infinitestimal effect on the overall energy program.

(3) Sears enthusiastically supports the concept of promulgating test procedures before establishing product standards.

(4) Sears has serious concerns regarding the establishment of "the estimated average life" of a product. Such concern becomes even more serious when an entirely new product is introduced into the market place which does not allow the manufacturer to revert back to previous product experience in estimating the product life. This concept of "estimated average life" continues to be included in all energy efficiency programs and presents one of the major shortcomings to implementation of a meaningful program. We will elaborate further on this point in our forthcoming full statement.

(5) The life cycle cost information regarding maintenance, use, or repair should be deleted from the program at this time. We would recommend that additional work be conducted in this area and that after the standard has been in existence for some time, that the life cycle cost be introduced. To introduce the life cycle information at the same time in the appliance energy program would be confusing to the consumer and could significantly delay implementation of the program.

(6) The amended energy policy recommends a re-evaluation within 5 years after the promulgation of the standard. It appears that a review within two to three years would be an adequate time lapse to generate sufficient information upon which to make changes if required and Sears, therefore, recommends such a review.

(7) It is not clear why the manufacturer is required to report energy efficiency data to the FEA periodically. Rather, the information on the energy label should stand on its own merits and, if challenged by the Government or any other interested party, substantiation should be required by the manufacturer. This procedure would be wholly in keeping with existing listing programs.

(8) Sears assumes that the original act continues to include a clause preempting state and local communities from generating their own energy efficiency labeling programs. It must be emphasized that practical production and merchandising problems involved with meeting numerous conflicting labeling requirements and test methods would truly be enormous. The cost of complying with such a system could be significant and obviously would be passed onto the consumer. Therefore, Sears strongly supports language that would clearly establish that energy efficiency standards pre-empt any state or local government standards, save for peculiar environmental problems to a particular region.

In conclusion, we appreciate the opportunity to present Sears position and will be available to assist the committee in whatever way possible.

STATE OF CALIFORNIA—STATE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

(Docket No. 75–CON–3)

IN THE MATTER OF: PROPOSED REGULATIONS FOR MINIMUM LEVELS OF OPERATING EFFICIENCY FOR REFRIGERATORS, FREEZERS, REFRIGERATOR-FREEZERS, ROOM AIR-CONDITIONERS AND CENTRAL AIR-CONDITIONERS

WRITTEN COMMENTS OF SEARS, ROEBUCK & CO.

Sears, Roebuck and Co. hereby submits its written comments on the above cited proceeding on Appliance Efficiency Standards.

Sears submits these comments due to a concern for the likely impact on consumers of the proposed minimum operating efficiency standards for refrigerators, freezers. refrigerator-freezers, room air conditioners and central air conditioners, which were published on July 29, 1976. Sears supports the efforts in this country

to reduce energy consumption and improve energy efficiency of energy using products. However, these efforts should proceed in the most reasonable and feasible manner possible so as to cause the least burden on consumers, as well as industry. Since Sears believes that manufacturers have already adequately presented to the Commission the practical problems which industry will face in complying with the proposed standards, this statement will address the impact of the proposed standards on consumers in terms of the models and features which would be available to California consumers after the proposals become effective.

The basic aspect of the proposed California standards which will cause severe impacts on consumers is the requirement that all products covered by the standards meet a certain prescribed minimum level of operating efficiency. Sears believes the better course of achieving energy efficiency is to establish levels of average efficiency for certain product lines. This approach permits the marketer of such products to continue to offer a range of models with a range of features at a range of prices, and thus continue to satisfy the ranges of needs and desires of consumers. Consumers are a diverse group. They do not all have the same needs, desires or financial means. Successful sellers of consumer products must be capable of filling these diverse requirements. Therefore, an average goal of energy efficiency permits marketers to continue to fill the various consumer needs while elevating the average level of energy efficiency in a manner which does not deprive some consumers of the models, features or price ranges they desire.

For the above reasons, Sears has supported the federal energy efficiency program. The current mandatory federal program being administered by the Federal Energy Administration, as well as the Department of Commerce's voluntary energy efficiency program before that, established targets or goals of improvement in energy efficiency over certain product lines. Sears believes the federal program has the potential to achieve significant energy efficiency improvement over the next few years, with a minimum of detrimental impact on consumers and industry. Therefore, since the California program must establish minimum levels of energy efficiency, rather than average efficiency levels, Sears urges the California Energy Resources Conservation and Development Commission to refrain from establishing minimum standards at levels which are so high as to be out of step with the federal program. Consequently, such minimum requirements necessarily should be below the average levels, which may be established by the federal targets, in order to avoid significant detrimental effects in the marketplace and the products available to the California consumer.

Sears presents below, for the Commission's consideration, a look at the effect of the proposed standards on the models, features and prices of refrigerators, freezers, refrigerator-freezers, room air conditioners and central air conditioners, which will be available to California consumers.

REFRIGERATORS, REFRIGERATOR-FREEZERS AND FREEZERS

As with air conditioners, the proposed standard for refrigerators, refrigerator-freezers and freezers would establish one minimum level of operating efficiency effective September 15, 1977, and a higher level on September 15, 1979. As an example of the effect of these proposals on the number of models which may be available in California in 1977 and 1979, Sears laboratory has calculated the energy consumption of the Sears refrigerators, refrigerator-freezers and freezers in the current 1976 Fall/Winter catalog in accordance with the formula set forth in the proposed standard (assuming that the Commission elects to require testing with the anti-sweat switches fully energized) and obtained the following results:

	Number of models in Sears catalog, 1976	Number of models which meet proposed minimum operating efficiency levels in—	
		1977	1979
Refrigerators (including compact models)	20	15	7
Refrigerator-freezers	7	7	0
Freezers:			
Upright models	17	10	2
Chest models	10	10	9
Total	54	42	18

The above numbers only represent models offiered through Sears catalog. There are more models available through Sears retail stores, which are not reflected in the above figures, but the above numbers exemplify the impact of the proposed standards.

While the numbers of models available for sale in California in 1979 may be greater than shown above, the types of models, features and price ranges of the models offered today, which will be eliminated in 1979, will not be available. To demonstrate the models, features and prices eliminated, attached as Exhibit A are copies of the pages from Sears current general catalog, which display refrigerators, refrigerator-freezers and freezers with the notation "Not Available for Sale in California" marked on those models which do not meet the 1979 standard.

It should be noted that since Sears catalogs distributed from Sears Los Angeles Catalog Merchandise Distribution Center are distributed outside the state of California to Nevada, Arizona, Utah and Hawaii, as well as in California, that such a notation will have to appear in catalogs in effect on or after the 1977 effective date. Such a notation, of course, will dramatically demonstrate to California consumers and taxpayers the reduced choice available to them. In a state where automobile emission standards have been set so high that automobile gasoline consumption rates exceed the rates of the same automobiles purchased outside California, Sears believes the California government should carefully consider the impact of proposed appliance energy efficiency standards on the California consumers before acting.

REFRIGERATORS: MODELS, FEATURES AND PRICE RANGES ELIMINATED BY STANDARD

Basically, there is no difference between the models of refrigerators (not including refrigerator-freezers) which meet the 1979 standard and those which do not. The more efficient models of refrigerators have better insulation and more efficient compressors and motors. More models with these efficiency features could be produced by 1979, but with a greater demand for such components in 1979, the cost of these components may increase, unless competition between components producers reduces the prices. If these components are needed only for products produced for one state, the need for these components may not be great enough to encourage more producers to enter the market, thus leaving the market to fewer component producers who may raise prices to those finished products manufacturers who want to sell products in the California market. The result of such an increase, of course, would be higher prices to consumers. The effect of the proposed standard on refrigerators—not including refigerator-freezers—is, therefore, very little except possibly on price. The other products covered by the proposed standard, however, are much more significantly affected, as noted below.

REFRIGERATOR-FREEZERS: MODELS, FEATURES AND PRICE RANGES ELIMINATED BY THE STANDARD

All refrigerator-freezers which Sears currently offers for sale will not be available for sale in California in 1979, under the proposed standard. These side-by-side refrigerator-freezers are very popular in the consumer marketplace. These products are actually part of the refrigerator market because consumers consider the side-by-side models at the time they consider the purchase of a new refrigerator. Well over a third of the people considering the purchase of a new refrigerator want refrigerator-freezers. An extremely high percentage of these people purchase refrigerator-freezers. In addition, Sears market research shows that refrigerator-freezers are more popular in the Pacific Coast states than in the rest of the country. Thus, the effect of the proposed standard is to eliminate a very popular product from the California consumer's choice.

The reasons consumers want refrigerator-freezers is because the side-by-side double door feature makes these products more convenient in terms of putting in and taking out food, and the food is more accessible to the user than in other types of refrigerators. An important reason consumers want refrigerator-freezers is that there is more freezer space than there is available in other types of refrigerators. People who buy refrigerator-freezers want the largest capacity available. They probably do not want to buy a separate freezer but still would like a large freezer capacity which would enable them to take advantage of sales and other special food bargains.

One feature of refrigerator-freezers which causes them to not meet the proposed standard is the frostless feature. While it may be possible to produce some refrigerator-freezers without the frostless feature, Sears offers this feature because of the overwhelming demand for it by consumers. Market research shows that 75–90% of the people in the market for large refrigerators want a frostless freezer compartment. Obviously, with the larger freezer compartments in side-by-side refrigerator-freezers, this feature is very important. Defrosting a small freezer by hand is a tedious enough job, but manually defrosting a 6–10 cubic foot freezer section would be tremendous.

Another feature which causes these products to fail to meet the proposed standard is the anti-sweat heaters. The purpose of these heaters is to prevent water condensing around the door gaskets and dripping onto the floor. This situation can occur in humid areas, such as the coastal areas of California. Without the anti-sweat heater in these areas, water can form and drip onto the floor, thus causing water damage to the floor. This water can also cause the refrigerator-freezer to rust. Neither of these results make consumers happy with the product. Consequently, if this feature were eliminated in order to produce refrigerator-freezers which meet the proposed standard, consumers in humid areas will not be as satisfied with the product as they are with the current models.

If the Commission adopts the proposed standard, Sears believes it should be aware of the types of features which will be eliminated in 1979 by such an action In the alternative, however, Sears suggests that the proposed 1977 level of efficiency for refrigerator-freezers be the only standard adopted for these products and that the 1979 standard be deleted. This would result in not unduly restricting the consumers' choice in 1979, while still maintaining an efficiency requirement, which would eliminate very insufficient products from the market.

FREEZERS: MODELS, FEATURES AND PRICE RANGES ELIMINATED BY STANDARD

The proposed 1979 standard for freezers would eliminate all but two upright models now available through Sears catalog. Only one chest model freezer would be eliminated. Again, one factor in this result is the frostless feature available in some of the upright models which would be eliminated. All of the chest freezers require the conventional manual defrost procedure. However, the reason Sears offers the frostless feature on uprights is because this is what consumers want.

The type of people who buy chest freezers differ from those who buy upright models. The chest freezer purchasers want large capacity at low price. These people want to store meat, vegetables and produce in bulk. These are economy-minded people.

The people who purchase upright freezers are looking for convenience. It is easier to get food in and out of the upright freezers. It is easier to see the food. There is no need to bend over to get the food. The upright requires less floor space in the home. The people who purchase upright freezers are not so much interested in storing food in bulk as in being able to take advantage of sales and special buys on food. Because these people are convenience-minded, they consider the frostless feature most important more often than those who purchase chest freezers—by more than two to one.

Finally, it should be noted that the upright freezer market is somewhat larger than that for chest freezers. More people want upright freezers than chest freezers. Therefore, if the standard, as proposed, is adopted, a large segment of California consumers in 1979 will not be able to purchase the frostless upright freezers they desire. As an alternative, Sears again suggests that only the 1977 standard be adopted for freezers. This would permit the freezer sellers to continue to offer a range of features and models to California consumers while eliminating inefficient models.

With regard to the test procedure to be used on refrigerators, freezers and refrigerator-freezers. Sears suggests that the Commission adopt the procedure which uses an average of the results when anti-sweat heaters are switched on and when switched off. This, of course, will result in permitting more models to be available for sale in California, but it is also a reasonable test procedure for California where the anti-sweat heaters are not as necessary as they are in more humid regions of the country. Consequently, it is likely that these switches are off a great deal of the time in Califorina. In fact, Sears refrigerators, freezers and refrigerator-freezers with this feature are shipped to our customers with the switch in the "off" position. Thus, they may never be turned on in many areas of California.

AIR CONDITIONERS

The number of models of Sears air conditioners offered for sale in the 1976 Spring/Summer catalog which will meet the proposed California operating efficiency standards are as follows:

	Number of models in Sears catalog, 1976	Number of models which meet proposed minimum operating efficiency levels in—	
		1977	1979
Central air conditioning	40	34	2
Room air conditioners	22	6	3

As with refrigerators, freezers and refrigerator-freezers, thee numbers above only include models offered through Sears catalog. More models are offered through Sears retail stores. Consequently, these numbers are an example of the impact of the proposed standards on the availability of Sears air conditioners.

While the number of models available for sale in California in 1979 may be greater than shown above, the types of models, features and price ranges of the models offered today, which will be eliminated in 1979, will not be available. To demonstrate the models, features and price ranges eliminated, attached as Exhbit B are copies of the pages from Sears 1976 Spring/Summer catalog, which display central and room air conditioners with the notation "Not Available for Sale in California" marked on those models which do not meet the 1979 standard. As mentioned previously, such a notation will have to appear in catalogs distributed from Los Angeles and effective after the effective date of the California standards.

CENTRAL AIR-CONDITIONERS: MODELS, FEATURES AND PRICE RANGES ELIMINATED BY STANDARD

The proposed minimum operating efficiency level for central air conditioning systems in 1979 is so high it practically eliminates all systems. Only two systems in Sears current line would meet the standard. These are Sears highest priced 29,000 BTU systems—one for counterflow or upflow furnaces and one for horizontal furnaces. These were offered in the 1976 Spring/Summer catalog for $772 and $782, respectively. Other comparable size systems sold for $641 and $651 (28,000 BTU's), $639 (30,000 BTU's), $569 (30,000 BTU's) and $539 (31,000 BTU's). Thus, the system which meets the standard is $120–$230 more than other systems of comparable size.

The higher price of the complying system is a result of a larger condenser and a special coil. Sears offers eight systems, ranging from 24,000 to 42,000 BTU's with these features, but only the two 29,000 BTU systems meet the standard. Consequently, other technical changes resulting in further price increases will be necessary to enable any seller to offer a full range of sizes in central air conditioning systems in California in 1979.

Manufacturers which sell and distribute appliances throughout the country are not likely to make substantial efforts in research and development of special systems nor make capital investments to produce special systems just to meet the energy efficiency standard of one state—particularly since these manufacturers will be expending such efforts to meet the federal energy efficiency targets which apply nationally.

Without a full range of sizes to offer consumers, it is likely many retailers will not offer any central air conditioning systems for sale in 1979. Every consumer has different needs, and it would be inefficient and foolish to sell every consumer who wanted a central air conditioning system a 29,000 BTU system, if that were the only complying system available. The system would work too hard, run too long and incur high repair costs if installed in a home which needs a larger system. The consumer with a home which requires a smaller system would be paying a higher price than necessary. Consequently, it would be unfair to California consumers for any seller to sell central air conditioning when the choice of sizes would be limited to one.

In order to enable sellers to offer a full range of sizes, Sears suggests that the Commission reduce the level of energy efficiency required of central air con-

ditioning systems sold in California on or after September 15, 1979. Sears believes an energy efficiency ratio of 8.0 would be a reasonable level at which a wide range of sizes could be offered, while still prohibiting the sale of inefficient systems.

ROOM AIR CONDITIONERS: MODELS, FEATURES AND PRICE RANGES ELIMINATED BY STANDARD

The effect of the proposed operating efficiency standards on the availability of room air conditioners is to eliminate the smallest and largest models now available. The smallest unit in Sears current line which would meet the 1979 standard is 7,800 BTU's. The largest complying unit is 14,000 BTU's. The current line as shown in the 1976 Spring/Summer catalog ranges from 4,500 BTU's to 29,000 BTU's.

In addition to eliminating the smallest and largest sizes of room air conditioners, the medium size models available are heavier and more expensive than comparable size models which do not meet the standard. For example, the smallest size model Sears offers (7,800 BTU's) which will meet the standard weighs 116 pounds and sells for about $270. Another model which has a 7,500 BTU capacity weighs 87 pounds and sells for about $190. The effect of these differences on consumers will be very significant.

About one-third of the purchasers who buy room air conditioners buy units under 8,000 BTU's. Of course, many of these are much smaller than the 7,800 BTU model Sears currently offers, which will meet the proposed 1979 California standard. The reason for this is apparent in the reason these consumers buy small units. These people want a low-priced air conditioner, which fits in a window, is portable and is easy to install. More than 80% of these people install the air conditioner themselves. Obviously, the heavier the air conditioner, the more difficult it is to install. If the consumers cannot install the unit themselves, they will have to pay an installer for installation and thus add to the cost of the purchase.

If a 7,800 BTU unit which weighs over 100 pounds and sells for about $270 is the smallest, lowest-price air conditioner available in 1979, many California consumers who want a small, inexpensive, easy-to-install air conditioner—such as Sears current 4,500 BTU unit, which weighs 75 pounds and sells for $120—will be unable to purchase such a unit. Most of these consumers live in metropolitan areas in duplexes or apartments and purchase the unit for their bedrooms. This indicates that their economic circumstances may preclude them from purchasing the more expensive 7,800 BTU air conditioner model. Consequently, these people in California will probably not purchase any air conditioner after 1979.

For the people who do purchase a larger unit than they would have otherwise, they will likely have to have the unit shipped to their home, since it would be too heavy to carry home from the store. Whether they pay for this in the price of the product or pay extra for delivery, this adds to the cost of the purchase, which would not have been a factor if such consumers could have purchased lighter, portable models and taken them home. After the heavier models are home, these consumers are more likely to have to pay to have the units installed, since self-installation is more difficult with a 100-pound-plus unit. The heavier units are also more difficult to service, and thus repair costs will be higher than those for smaller units. These consumers will also suffer the inconvenience of not being able to move the air conditioner from room to room as smaller, lighter units can be.

In addition to small room air conditioners being eliminated, the larger units will also be eliminated. No Sears room air conditioner over 14,000 BTU's will meet the proposed 1979 standard. Many people with smaller homes purchase large room air conditioners to cool the entire house or a large portion of their home as an alternative to incurring the expense of installing centrol air conditioning. In 1979, these people in California will have the choice of purchasing two or more smaller units or purchasing central air conditioning, if it is available. Either of these options is, of course, more expensive. For example, Sears current 29,000 BTU room unit sells for about $530, while two of the 14,000 BTU units meeting the standard would amount to $760. In addition, two air conditioners would have to be installed instead of one. Further, Sears 29,000 BTU central air conditioning system which meets the proposed standard sells for $772–$782. Consequently, those who would have bought a large room air conditioner will have to pay more than $200 more in 1979 for comparable cooling capacity.

To make it possible to offer a wider range of sizes of room air conditioners in California in 1979, Sears suggests that the Commission consider revising

the required minimum energy efficiency ratios by establishing different ratios in different size ranges. Since the proposed standard would eliminate small and large room air conditioners, Sears suggests that the required energy efficiency ratios be reduced for units 8,000 BTU's and smaller and units over 14,000 BTU's to 8.0. The 8.7 energy efficiency ratio currently proposed is a reasonable level for units from 8,000 to 14,000 BTU's. Sears believes such a sliding scale standard would establish reasonable levels, which would enable sellers to offer a range of sizes at a range of prices while precluding the sale of inefficient models.

Finally, it should be noted that if the current proposals for central and room air conditioners is adopted, since it would so severely restrict the range of models available for sale in 1979, unless considerable development efforts and capital investments are made, many air conditioning manufacturers may decide not to sell in the California market. The California market for air conditioners may not be sufficiently large enough for some manufacturers to justify the additional effort and investment that would be required to meet standards so out of step with the federal energy efficiency program. For example, Sears sells only about 3½ percent of its room air conditioners in California. If this is indicative of the industry, California consumers may not be able to purchase any air conditioners after 1979 unless the proposed standards are revised to more reasonable and achievable levels at the time of adoption.

Even if stopping the sale of air conditioners in California is not the result, it is clear that if the proposed standards were adopted, that the California consumers' choice in purchasing air conditioning units or systems will be severely restricted after 1979. Sears urges the Commission to consider the impact of the proposal on consumers and make the changes recommended herein.

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